WORLD PETROLEUM

Ph - Sec 18

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MODERN OIL FIELD HARVEST

Flare Gas

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Like the pioneer days when they stripped the hide and tallow from range cattle and left the beef on the prairies, the days of burning off gas in open flares after it has lifted a load of oil to the surface will soon be gone forever.

Process plants to harvest valuable hydrocarbons from gas now wasted, releasing the dry gas for fuel or returning it back in the ground for future use, have doomed the squandering gas flares.

In the field of repressuring and recycling, Brown & Root, Inc., offer complete service, from design through engineering, fabrication and erection, all in one good organization.

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THE HORTON DOUBLE-DECK FLOATING ROOF

. . . . four reasons why it does a better job of preventing evaporation losses and reducing fire hazard

- **THE HORTON SEAL . . .** which prevents the escape of vapor between the deck of the roof and the tank shell.
- **DOUBLE-DECK CONSTRUCTION . . .** which insulates the liquid and reduces surface temperature.
- **SMOOTH TOP DECK . . .** which provides positive drainage.
- **SPECIALLY CONSTRUCTED BOTTOM DECK . . .** which eliminates the vapor space under the roof.

THE greater the throughput at refineries, pipe line stations, natural gasoline plants, tank farms and bulk stations, the greater the chance for evaporation ...and, thus, the greater the need for a more effective means of reducing evaporation losses. The Horton Double-Deck Floating Roof is the logical device for cutting down evaporation losses from tanks storing volatile products that do not boil at normal temperature. It is particularly recommended for working tanks that are filled and emptied more than six times a year, tanks in blending service and tanks storing sour crude oils or other corrosive products.

For the complete story on the Horton Double-Deck Floating Roof, write for our new Bulletin B.

The view at the top of the page shows a Horton Double-Deck Floating Roof on a 24,000 bbl. tank 60 ft. in diam. by 48 ft. high. The small view directly above shows a close-up of the Horton Seal.

Other Chicago Bridge & Iron Company products for preventing evaporation losses throughout the petroleum industry

HORTONSPHERES . . . for storing volatile liquids and gases

HORTONSPHEROIDS and HEMISPHEROIDS . . . for storing moderately volatile products

HORTON VAPORSPHERE . . . to prevent evaporation loss from fixed-roof tanks storing crude oil or gasoline

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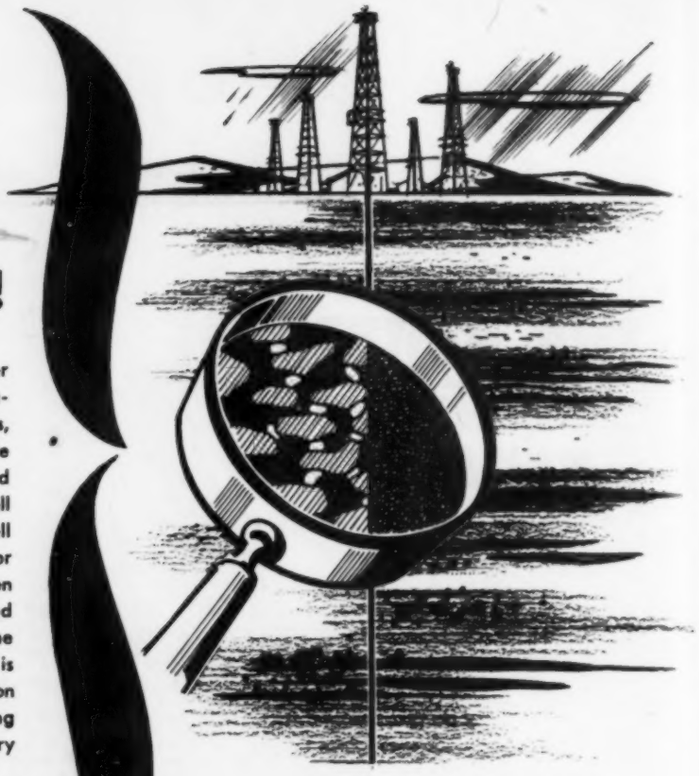
Why water is COSTLY...

IN THE PRODUCTION ZONE!

THE FILTRATE from a water base drilling fluid is water and, in many cases, water plus fine solid or silty materials or chemicals. This filtrate, common to all water base drilling fluids, is squeezed out of the mud and into the formation around the borehole because the pressure of the mud against the formation being drilled must be in excess of the formation pressure in order to control the well while drilling with rotary tools. This water remains in place until the well is brought on production. At this time "free" water is displaced by oil or gas. A quantity of the water will always remain held in place between the tiny particles of the formation by capillary action and is not dislodged even by excessive pressures. This locking of the particles of water in the crevices between the sand grains is known as "water blocking" and is due to Jamin action*. This water blocking decidedly restricts production and the ultimate recovery of oil from the well. The tighter the producing formation the more complete is this water blocking action. Even in very permeable formations this water blocking is still very detrimental.

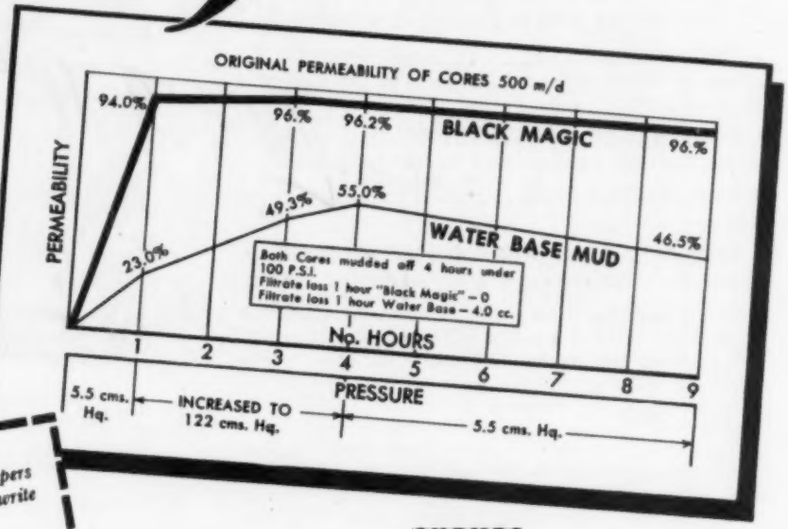


Schematic view of oil sands surrounding the zone of production showing how the surface tension of water particles locks them in the minute crevices thereby blocking off the flow of crude oil.

"BLACK MAGIC" ELIMINATES WATER BLOCKING

Black Magic oil base drilling fluid as the comparative curves show, eliminates water blocking. There is *no* free water in Black Magic. While Black Magic has only a paper thin "cake," there is a zero filtrate loss. Due to elimination of water blocking, there can be no displacement of connate water in core samples. Accurate information for development evaluation is obtainable with Black Magic as with no other medium.

Consider some of the many other advantages of Black Magic: May be regenerated and used over and over again. Is not affected by salt, anhydrite, gypsum, limestone, or cement, therefore, no expensive chemicals are needed. "Heaving" or hydrous disintegrating shales remain in place due to Black Magic's perfect plastering and lack of water filtrate.



CURVES

Synthetic cores of 500 m/d mudded off—one with Black Magic, one with a starch treated clay mud. Cores were deplastered with simulated crude (80% white oil, 20% Kerosene) and permeability measured over a nine hour period. *Note approximate full recovery of original permeability in one hour by core mudded off with Black Magic.*

This is why your production is increased—*you are producing from all of the oil zone when you have used Black Magic*—instead of less than half of it due to water-blocking and mudding off with water base mud.

*We have available a number of reprints of technical papers describing Jamin action and its effect. Send in the coupon or write for your free copies of these informative papers.

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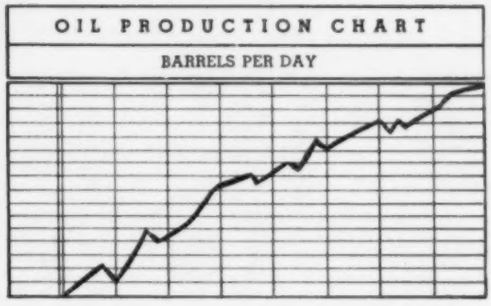
Always on the "up-and-up"

So long as the rod goes up and down...

production profits go up-and-up.



The primary function of any sucker rod is to lift well-fluids to the surface with minimum down time due to rod failures.

The greater the continuous uninterrupted production time, the greater the profits, on any well. This uninterrupted production marks the difference between just any rods and Axelson rods.

Axelson Sucker rods are scientifically and metallurgically engineered to withstand the fatigue and corrosion that shortens the life of an ordinary rod. Connected by *perfectly aligned couplings*, they present a string of rods that will give the greatest service life with the minimum cost for maintenance.

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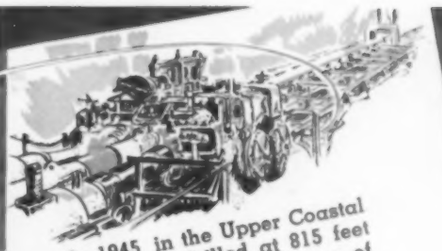
DEEP WELL PLUNGER PUMPS AND SUCKER RODS

Youngstown to the TEXAS GULF COAST



No region of North America is richer in oil than the Gulf Coast of Texas. There in a broad belt stretching from the Sabine to the Rio Grande, out in the waters of the Gulf itself and over a hundred miles inland, oil men produce nearly a fifth of the country's crude. There, too, is stored an even larger portion of the nation's proven reserves.

To produce this oil calls for unusual ingenuity, hard work, perseverance and high grade equipment in overcoming almost every difficult condition known to oil men. Barge drilling, deep drilling, high pressure drilling—such operations are commonplace in the lives of Texas Gulf Coast oil men. In 1945 in the Upper Coastal district a hole was drilled at 815 feet more than three miles down—one of the world's deepest wells.

When the pioneers struck oil at Spindletop in 1901, Youngstown was just a year old. Throughout the oil history of this great region, Youngstown has supplied a large share of the oil country tubular goods. Operators in the several districts comprising this coastal area have found that Youngstown drill pipe, casing, tubing and line pipe is suitable for their toughest drilling, production and transportation requirements. Here, as in every other field, the orange bands on pipe are recognized as the sign of quality.

Locations circled indicate Continental Supply Company stores

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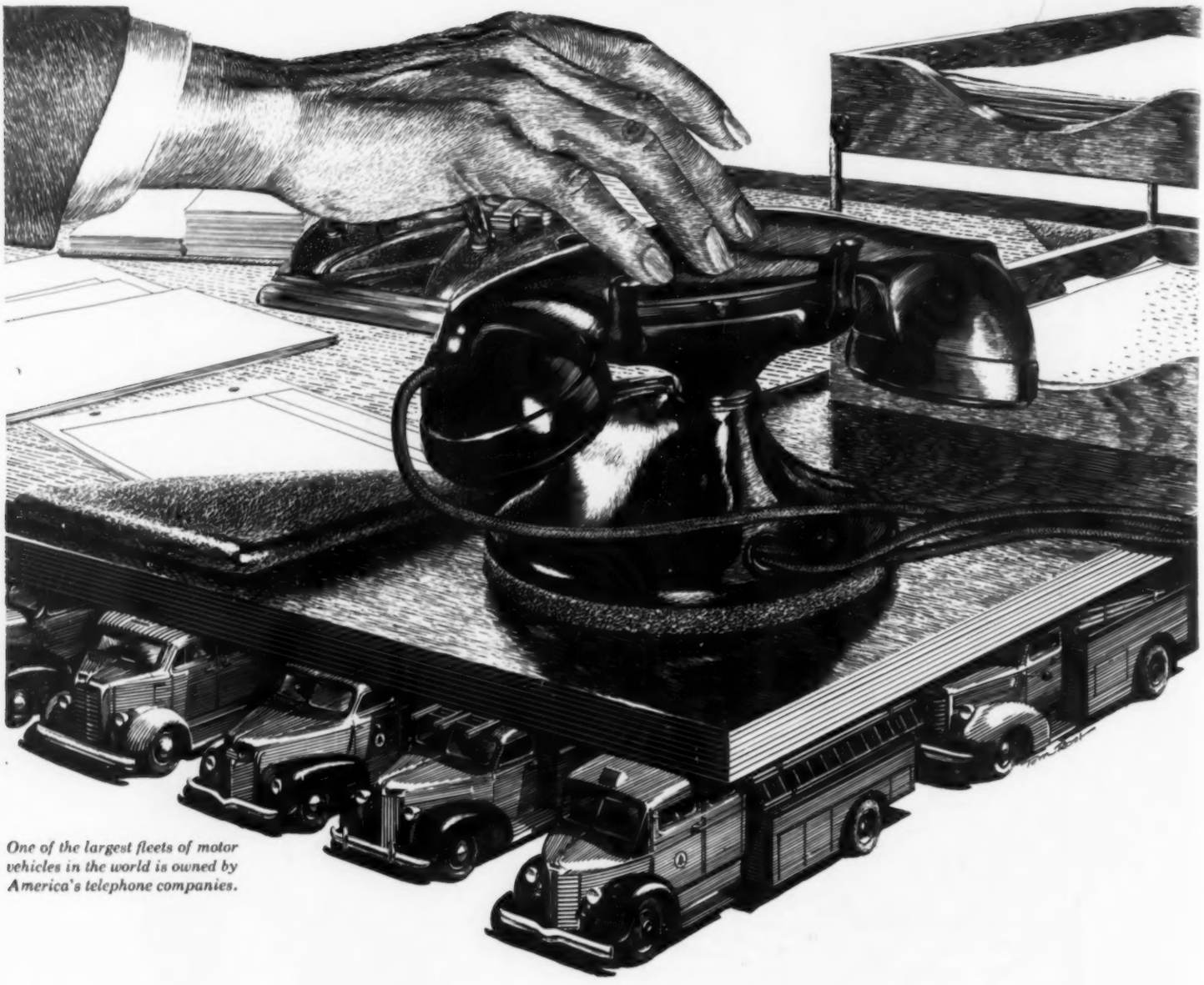

One of the largest fleets of motor vehicles in the world is owned by America's telephone companies.

Your telephone call rides on gasoline

YOU'RE used to thinking of a telephone call as a matter of wires and cables and switchboards. But did you ever consider how many cars, trucks, and trailers go into each call? Day and night, in all kinds of weather, gasoline motor vehicles are helping to maintain telephone lines, carrying repair crews, hauling telephone poles and other equipment.

Thus, each improvement in gasoline transportation has helped to improve telephone service—a service which today is the best in the world, in spite of current shortage conditions.

Improvements in gasoline during the past twenty years have been frequent. As refiners developed new refining processes and made greater use of Ethyl brand antiknock compound, the octane rating of gasoline has steadily climbed. Better gasoline, in turn, has made possible better engines—more efficient and economical gasoline transportation.

This trend to improved fuels and better engines has by no means reached its end. As current "reconversion" difficulties are overcome, petroleum refiners look forward to gasoline better than anything ever marketed in the past. Automotive engineers look forward to producing engines to utilize the future gasoline. And we of Ethyl are already cooperating with both the automotive and petroleum industries in solving the technical problems of advanced gasoline power. Ethyl Corporation, Chrysler Building, New York 17, N. Y.

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STANDARD OF QUALITY

Ask piping men in any field. They all have the same reasons for standardizing on Crane Equipment. Makes the whole job easier, they say, from design to erection to maintenance work.

Getting everything from one source means simplified specifying and buying. And getting it from Crane assures top quality in all materials for any piping installation.

Naturally, the easier way to better piping is to have Crane supply everything. For only the Crane line gives you this 3-way advantage:

ONE SOURCE OF SUPPLY giving you the world's most complete selection of valves, fittings, pipe, accessories and fabricated piping—in brass, iron, and steel—for all power, process, and general service applications.

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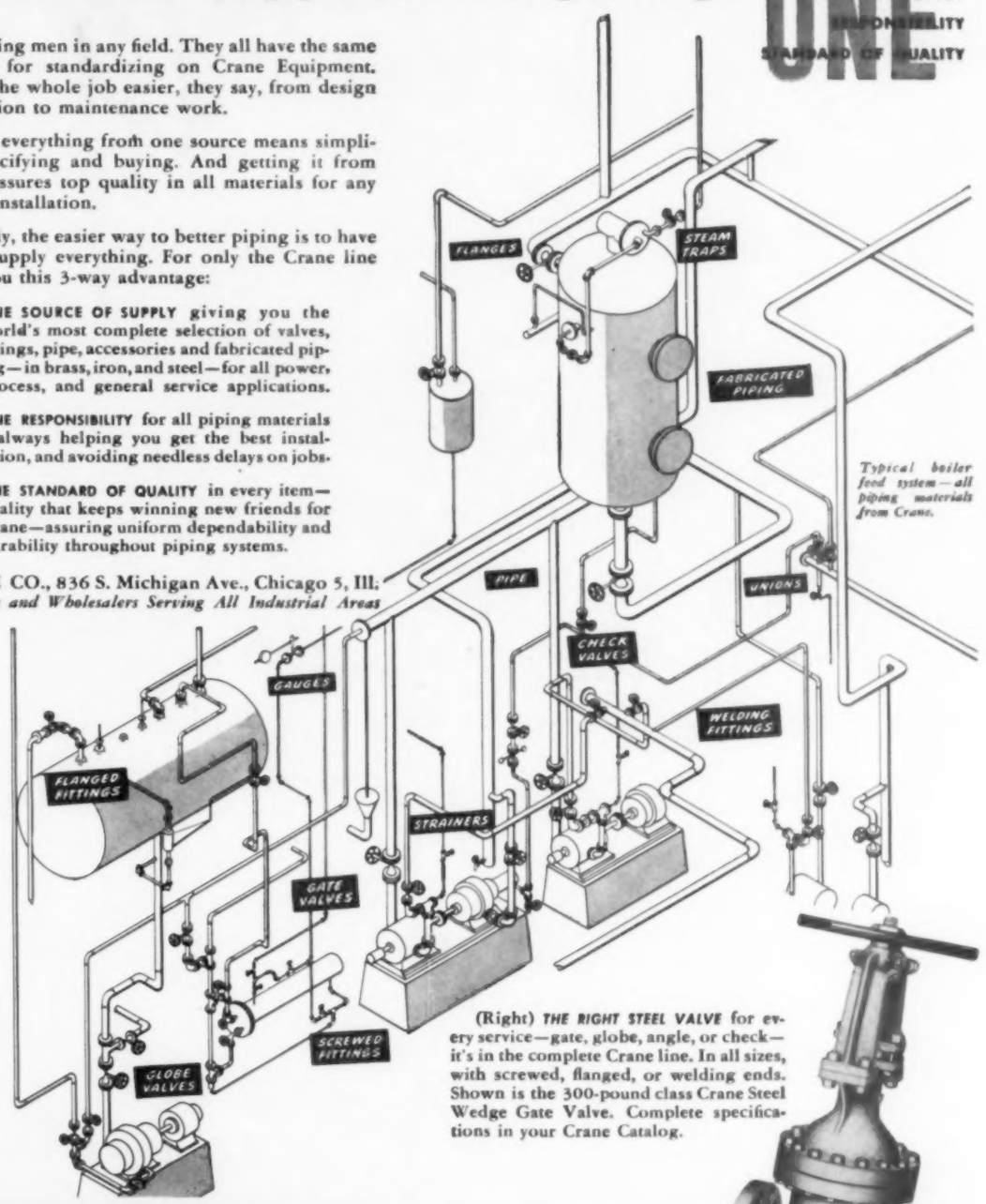

Typical boiler feed system—all piping materials from Crane.

(Right) ***THE RIGHT STEEL VALVE*** for every service—gate, globe, angle, or check—it's in the complete Crane line. In all sizes, with screwed, flanged, or welding ends. Shown is the 300-pound class Crane Steel Wedge Gate Valve. Complete specifications in your Crane Catalog.

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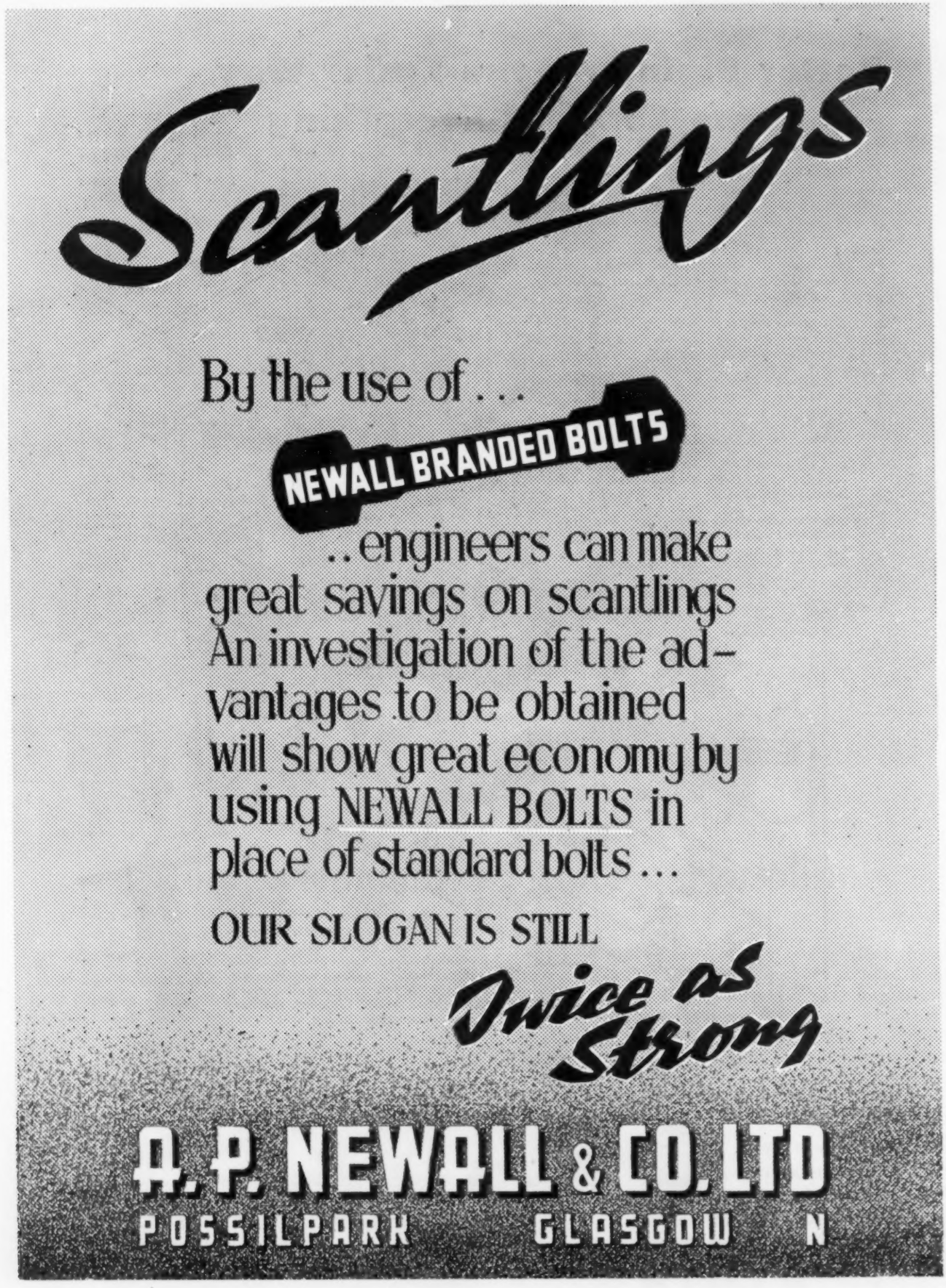
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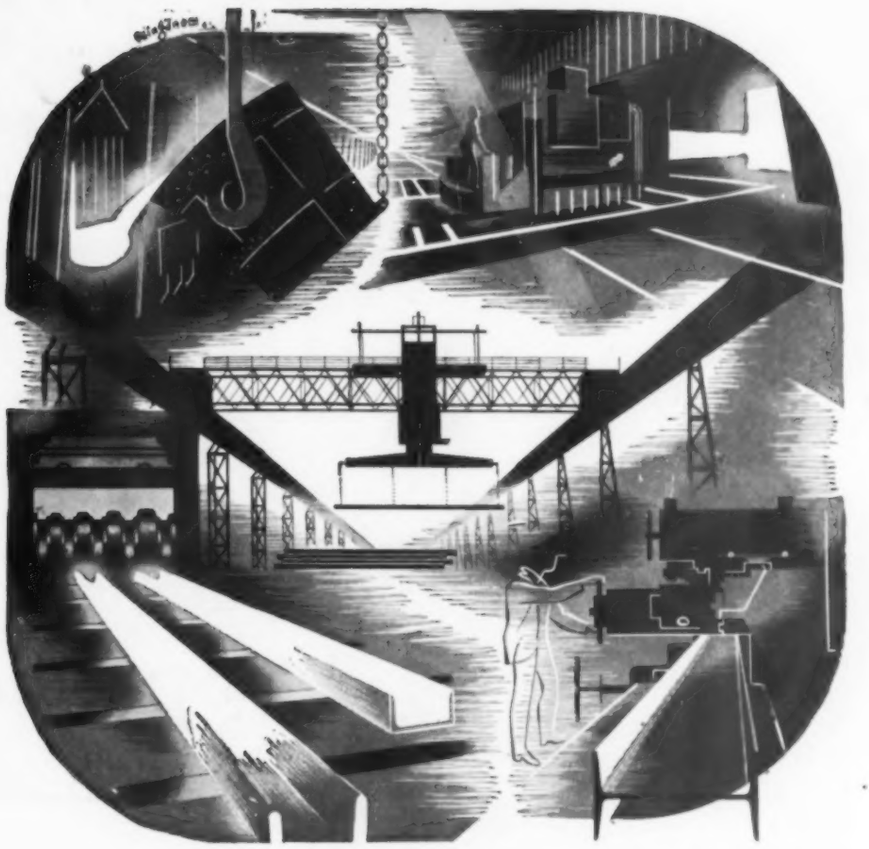

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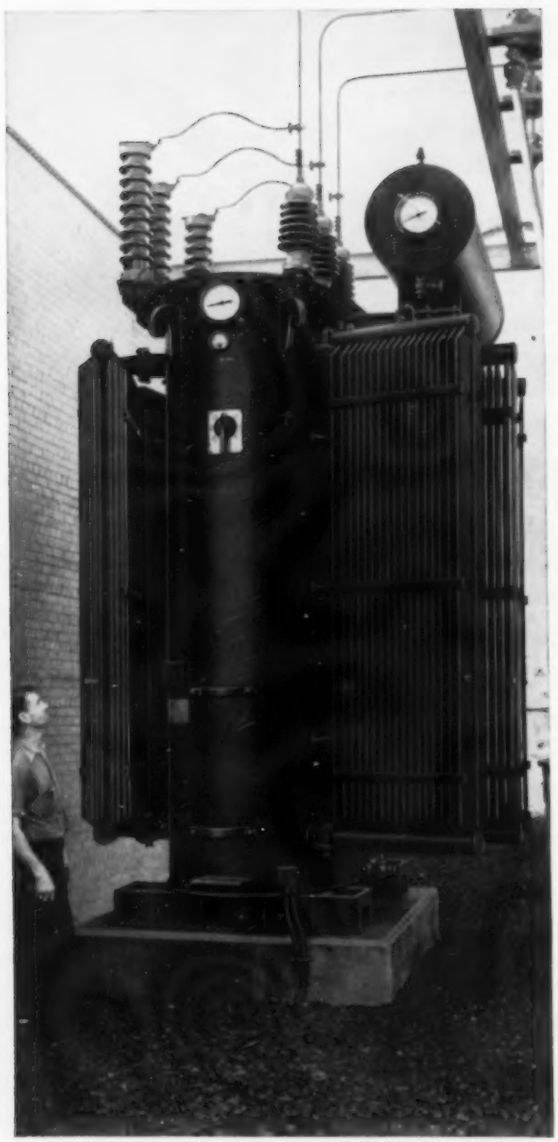

These Power Transformers Meet Refinery Specifications!

YES, YOU CAN SELECT A STANDARD Allis-Chalmers power transformer that will handle your refinery job with top efficiency and safety. You can get units for single-phase or three-phase — air, oil, or chlorextol non-inflammable liquid-filled — in any practical size or voltage . . . units designed to meet your particular requirements and give you many years of trouble-free service.

If you have any problem regarding voltage transformation or control, call the Allis-Chalmers transformer engineer in your nearby A-C Sales Office. He'll be glad to show you how similar situations have been handled . . . to give you the benefits of engineering skill backed by broad experience, and complete research facilities and technical knowledge. ALLIS CHALMERS, MILWAUKEE 1, WISCONSIN.

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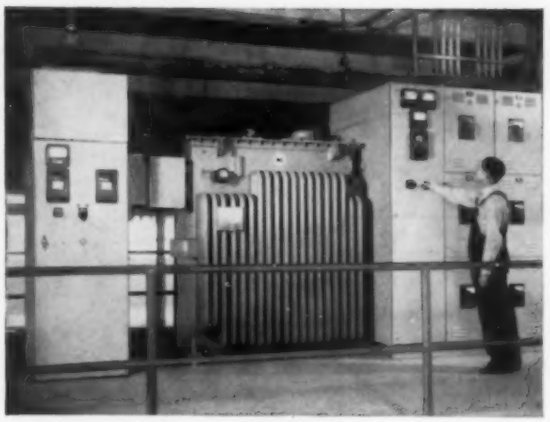

Planning to Install Unit Substations?

IT will pay you to check *Standard Prefabricated Unit Substation Equipment* offered by Allis-Chalmers. It provides greater interchangeability and flexibility when future changes are necessitated . . . and is lower in original cost . . . can be replaced more quickly if any elements are damaged.

OUTDOOR OR INDOOR UNIT SUBS?

Weather-proof construction is available in Allis-Chalmers Prefabricated Unit Subs. Outdoor installations allow use of lower cost oil-filled transformers . . . savings of valuable floor space . . . eliminate unfavorable ambient temperature conditions. Indoor installations do not require excessively long secondary cable runs . . . are easier to inspect, operate and maintain. Either way, Allis-Chalmers has a standard Unit Sub to do the job.

HOW ABOUT LOAD ELEMENTS?

Lighting load is often overlooked because in many plants it is a relatively small item. If lighting load is heavy — comparable to motor load — a separate sub-station may be advisable for its dependability. Allowance for load growth is another important factor to consider. Large increases of course, need not be considered because they naturally call for their own load center unit sub. Small increases are taken care of by using standard size transformers of the closest larger rating.

MANY CONSIDERATIONS GOVERN UNIT SUB SELECTION!

Are the transformers you are considering the proper size? Will the high voltage protection planned be adequate? Is the high and low voltage selected best for you?

To simplify Unit Substation Planning Allis-Chalmers is offering a Check List Bulletin B6325 which contains up-to-the-minute information which will help you to double-check your preliminary unit substation planning. Send for your free copy today.

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HEAVY CURRENT SURGES can easily damage your generating and transmission equipment unless they are adequately protected. Allis-Chalmers Air Blast, Magnetic Air and Oil circuit breakers interrupt short circuits fast . . . provide *complete* protection with a minimum of cost and trouble.

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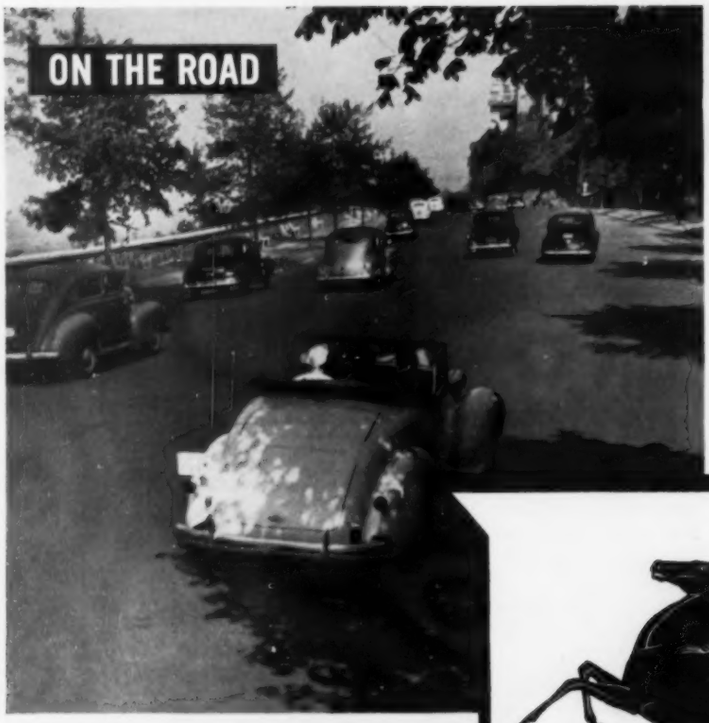
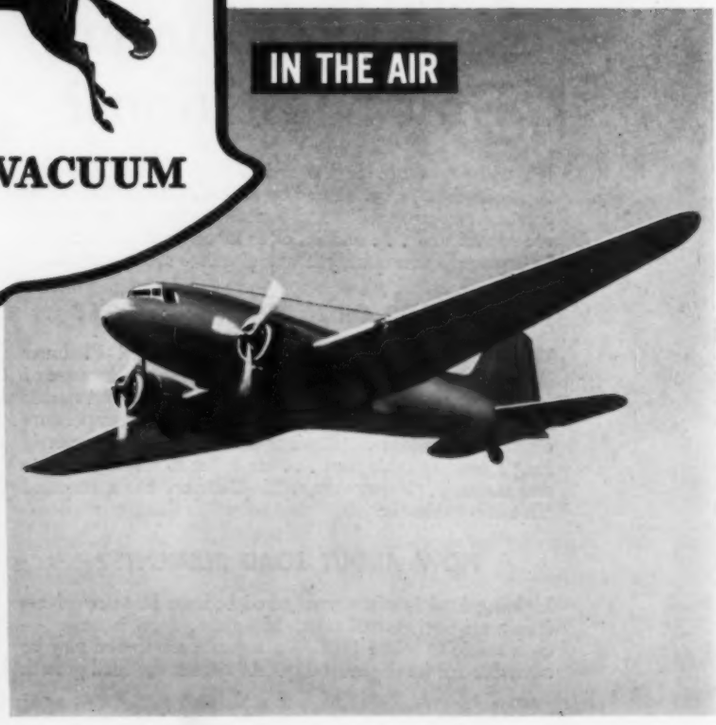


SOCONY-VACUUM



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PRESTON POWER STATION

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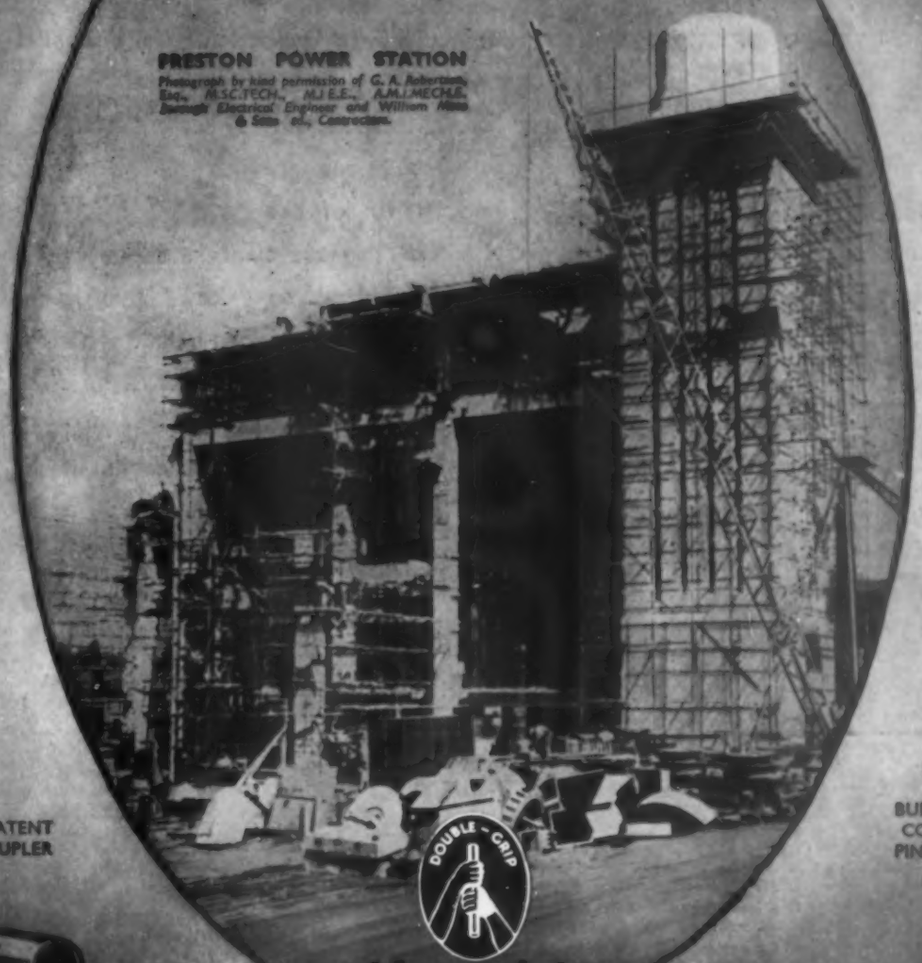

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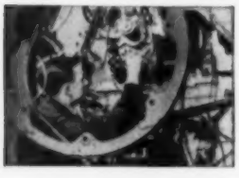

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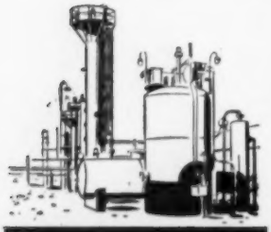
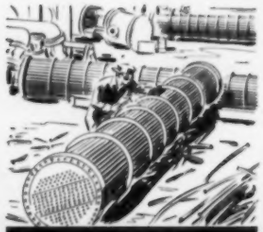


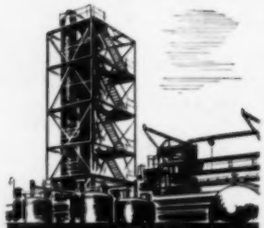
1 HIGH PERCENTAGE SALT REMOVAL

Petreco Desalting usually insures a salt removal of 90% or better, with 98% not uncommon.



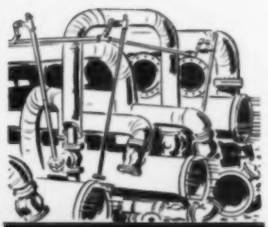
2 CORROSION PREVENTION

Petreco Desalting reduces corrosion by curtailing the evolution of HCl.



3 INCREASED CRACKING EFFICIENCY

A refinery comparison of two cracking stills shows a ½ cent per barrel gain for the still handling desalted crude—after desalting costs were met.



4 LESS "DOWN TIME"

"Down time" is frequently reduced as much as 50 to 90% wherever Petreco Desalters are installed.

5 ELIMINATION OF PLUGGING

A Petreco Desalter virtually always eliminates salt plugging.

6 TANK BOTTOMS DISPOSAL

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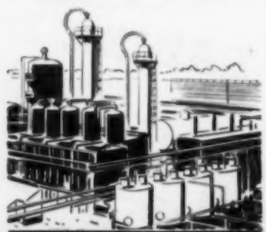

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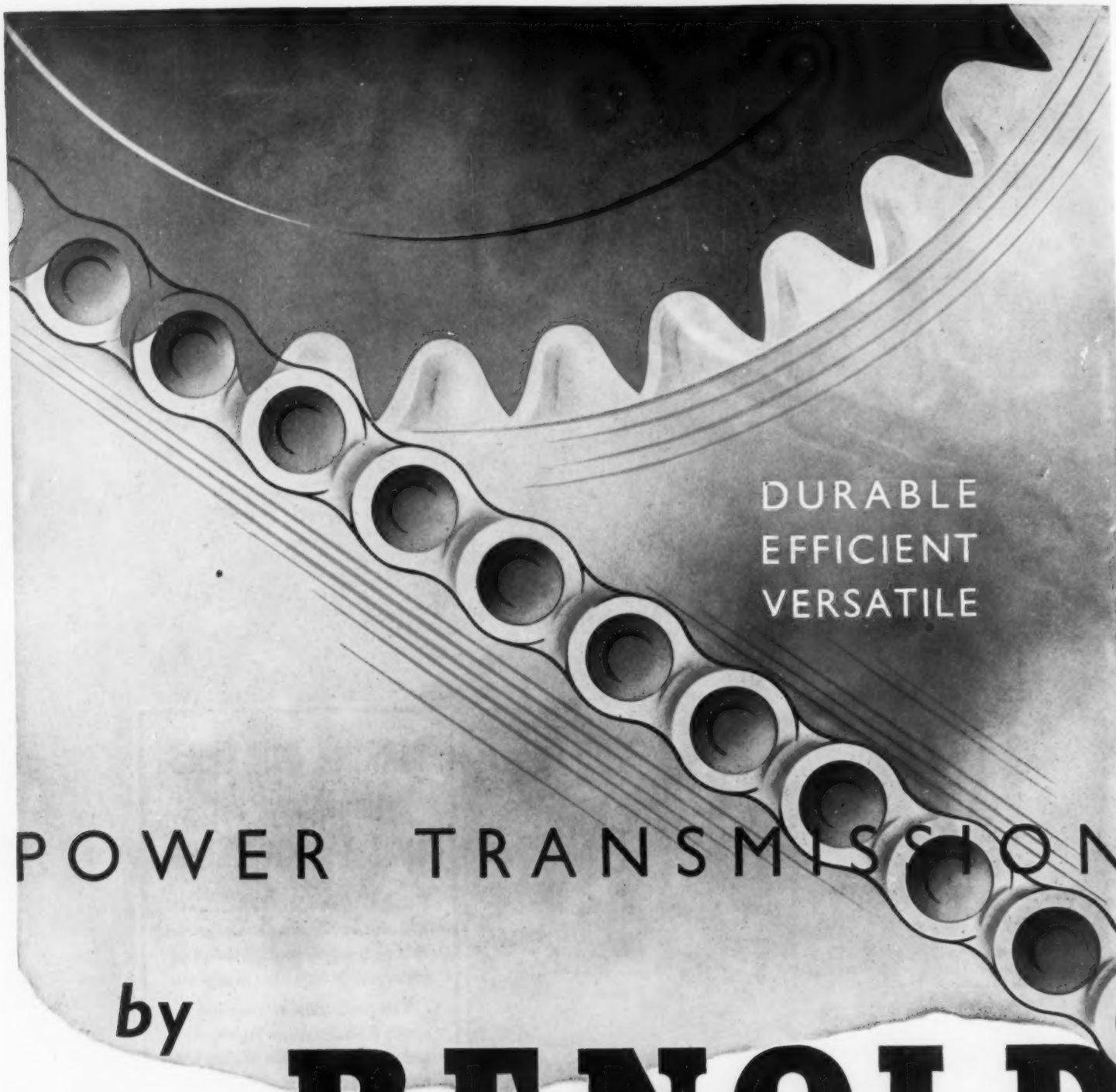

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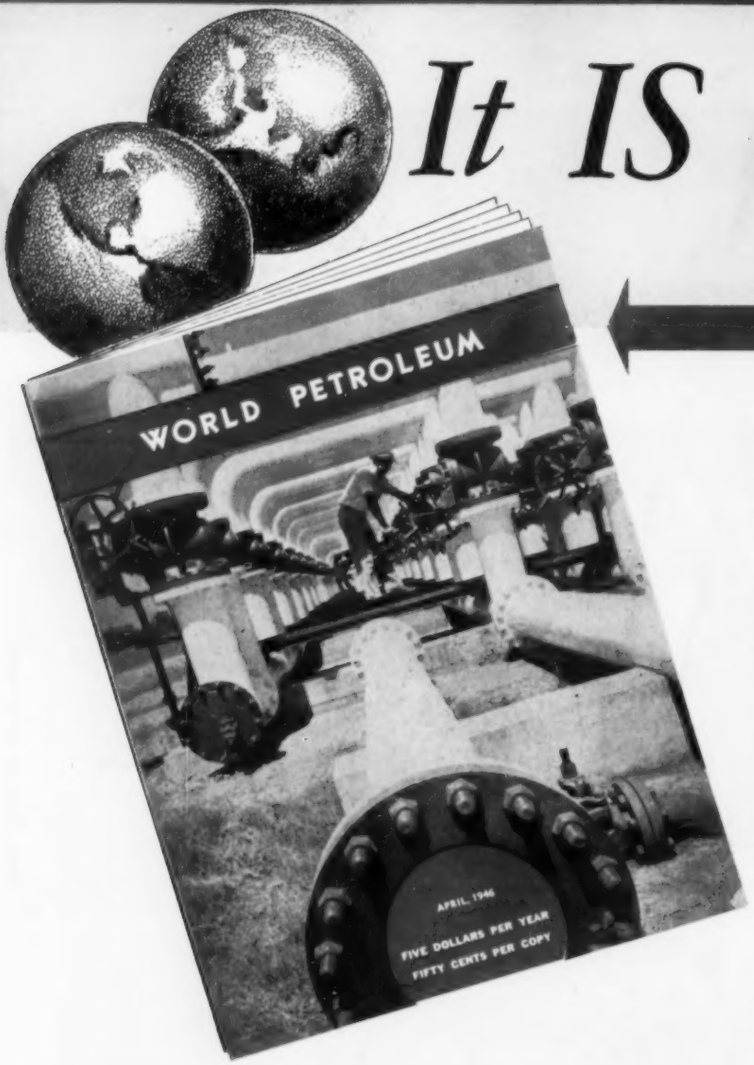

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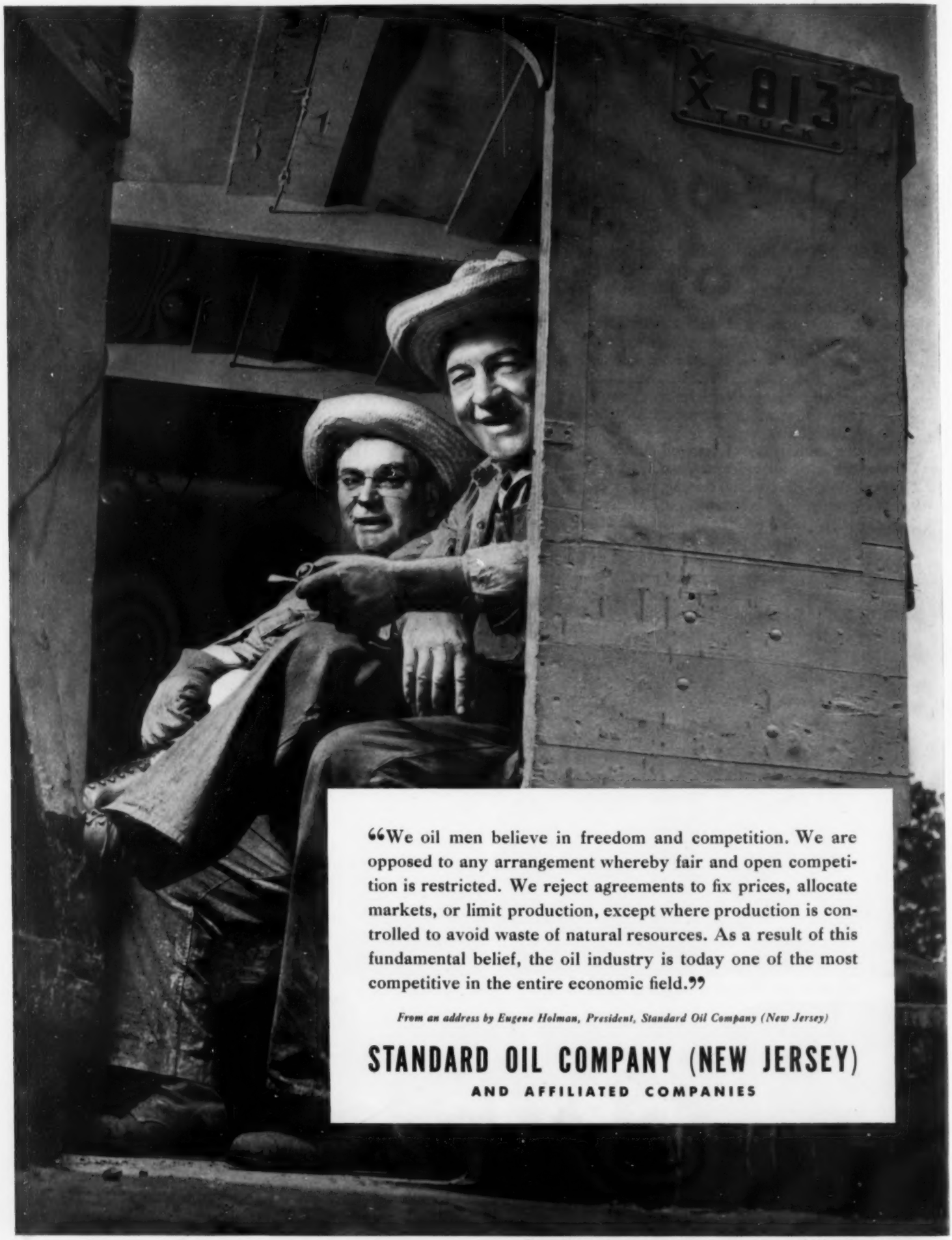

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E. W. Mayo
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CHICAGO 1: W. R. Cotton, Mid-West Advertising Manager, 307 No. Michigan Ave., *(Tel. Franklin 2508)*

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THIS MONTH'S COVER: Near Bahrein Island is the Sitra loading wharf, which extends three miles into the Persian Gulf from the tank farm on the shore of Sitra Island, shown in the upper left. The main dock can load four vessels simultaneously, and a second dock can berth two more tankers. Depth at the loading spots is eight fathoms, enough to accommodate the Queen Mary. Products of the Bahrein Refinery, currently operating on about 115,000 barrels per day, are loaded at this point. Bahrein Refinery receives a considerable portion of its crude from Saudi Arabia with which it is connected by the longest commercial submarine pipe line in the world. Photo by Robert Yarnall Richie.

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EDITORIAL

MIDDLE EAST OIL AGREEMENTS

IF the agreements recently arrived at between oil companies with holdings in the Middle East had been been concluded under similar circumstances by groups operating in some other part of the world, they probably would have received only passing notice in the trade. Because of the attention focussed upon that part of Asia Minor lying between the Mediterranean and the Red Sea on the west and the Persian Gulf on the east, however; because of the political rivalries that have centered there and the attempts of governments to intervene in its petroleum affairs; and finally because of the recognition that within this area lie probably the world's greatest reserves of oil, anything affecting Middle East oil becomes the subject of worldwide discussion — and usually of controversy — in the press, in the chancelleries of leading nations and even in the daily conversation of private individuals who have nothing at stake in the matter.

Thus, when it was publicly announced that two of the largest American oil companies had arranged to acquire a very substantial but still a minority interest in a valuable Arabian concession owned by two other American companies, and when it was made known almost simultaneously that the same two companies which were making this large investment had made a further arrangement to purchase crude oil from a fifth company—this one a British corporation—a great stir resulted. The daily press carried the report under conspicuous headlines, commentators analyzed the possible implications of the movements, and the opinions of "spokesmen" for various governmental agencies were quoted. Professional viewers-with-alarm denounced the transactions as a move toward the establishment of a cartel that would control production and prices, while others saw in it a scheme of inundate world markets with cheap eastern oil to the ruin of less fortunately situated producers. A French company which is a shareholder in Iraq Petroleum brought suit in a London court on the ground that the action of its American associates violated an agreement binding upon all members.

Examination of the agreements themselves reveals no substantial basis for the apprehensions that have been voiced. Admittedly a large increase in Middle East production is in contemplation. It probably will amount to a doubling of current output over a period of years. That, however, will be merely effectuation of plans which oil companies operating in that area have had in view of years past. More Mid-East oil will find its way to Mediterranean countries and western Europe when pipe lines and refineries long since projected have been built. This is not a monopolistic move. The action of the California-Texas Oil Company, in extending its market operations to include the entire Eastern Hemisphere presages a lively competition for markets among Middle East producers themselves.

The American companies participating in the transactions that have caused so much debate all have investments and obligations in the United States and elsewhere far transcending their interests in the East. Their managements certainly would not be so stupid as to enter upon a course that would impair these larger interests and earn for them the enmity of their fellow-citizens as certainly would result from an attempt to set up a world cartel or to injure the position of home producers by destructive competition.

Standard Oil Company (N.J.) and Socony-Vacuum, which are the two corporations involved in both the transactions that have caused so much discussion, have explained the reasons for their action very simply. They state that it stems from a desire to bring their future crude oil supply position in the European markets into gradual balance with expected market demands. Their production in the Eastern Hemisphere has always been insufficient to meet their needs in that part of the world. Pointing out that they are projecting a program for the next twenty years, they estimate that within that time the growing requirements of the Eastern Hemisphere will absorb the full production likely to be attained by the Middle East, while the oil output of the Western Hemisphere will be needed in the markets of that half of the world.

As for the suit brought by the French oil company, that patently raises a legal question which will be decided by the court. In well-informed circles, however, this action is looked upon more as an assertion of French claims to a voice in Middle East affairs and a right to be consulted than as an attempt to nullify the agreement that has been made.

Viewed in perspective, the recent agreements among Middle East companies appear as ordinary commercial undertakings inspired by commercial motives. At the same time the oil companies are to be credited with having introduced an element of stability into the Middle East oil situation which the diplomats have failed to accomplish.

PRINT IN BIND

Portable drilling rig on Bahrein island. California Texas Oil Co. Ltd. Note: All photographs of Arabian American and Bahrein Petroleum Company properties with this article are by Robert Yarnall Richie.

Oil pipe lines in the Tembi area of the Masjid-i-Sulaiman oil field. Anglo Iranian Oil Co. Photograph.

NEW CHAPTER

NOT since the final organization of the Iraq Petroleum Company put an end to the long struggle for control of the oil of Mesopotamia has any development in the petroleum industry aroused such widespread interest and comment as the negotiations now under way among leading international oil companies looking to joint action in the utilization of the vastly greater resources of the entire Middle East and the orderly absorption of its products into the fabric of international trade. There are numerous reasons for the significant importance attached to the separate but related agreements that are being worked out: the political rivalries that in the past have marked the competition for oil concessions in this part of the world; the great extent of petroleum deposits within the areas concerned; the apprehension on the part of producers in other quarters of the globe that a flood of Mideastern oil might disrupt world markets and blight their industries; the concern of governments over possible disturbances to future peace

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IN BINDING

OPENS IN MIDDLE EAST OIL

that might result from a struggle for control in this area where conflicting interests have so often clashed. It is not assumed, of course, that the arrangements now under way will dispose of all the problems of the Middle East, but, so far as the oil industry is concerned, they obviously constitute a constructive step, and the fact that the participants include leading companies among those engaged in international activities removes some of the doubts and fears that have prevailed within the ranks of the industry.

So far as confirmed by the companies concerned, the agreements now in process of completion include the following proposals:

(1) Acquisition by Standard Oil Co. (N.J.) and Socony-Vacuum Oil Company of shares of Arabian-American Oil Company which is now jointly owned by Standard Oil Company of California and The Texas Company. The extent of their participation will represent a minority interest, probably 30 percent to Jersey Standard and 10 percent to Socony-Vacuum.

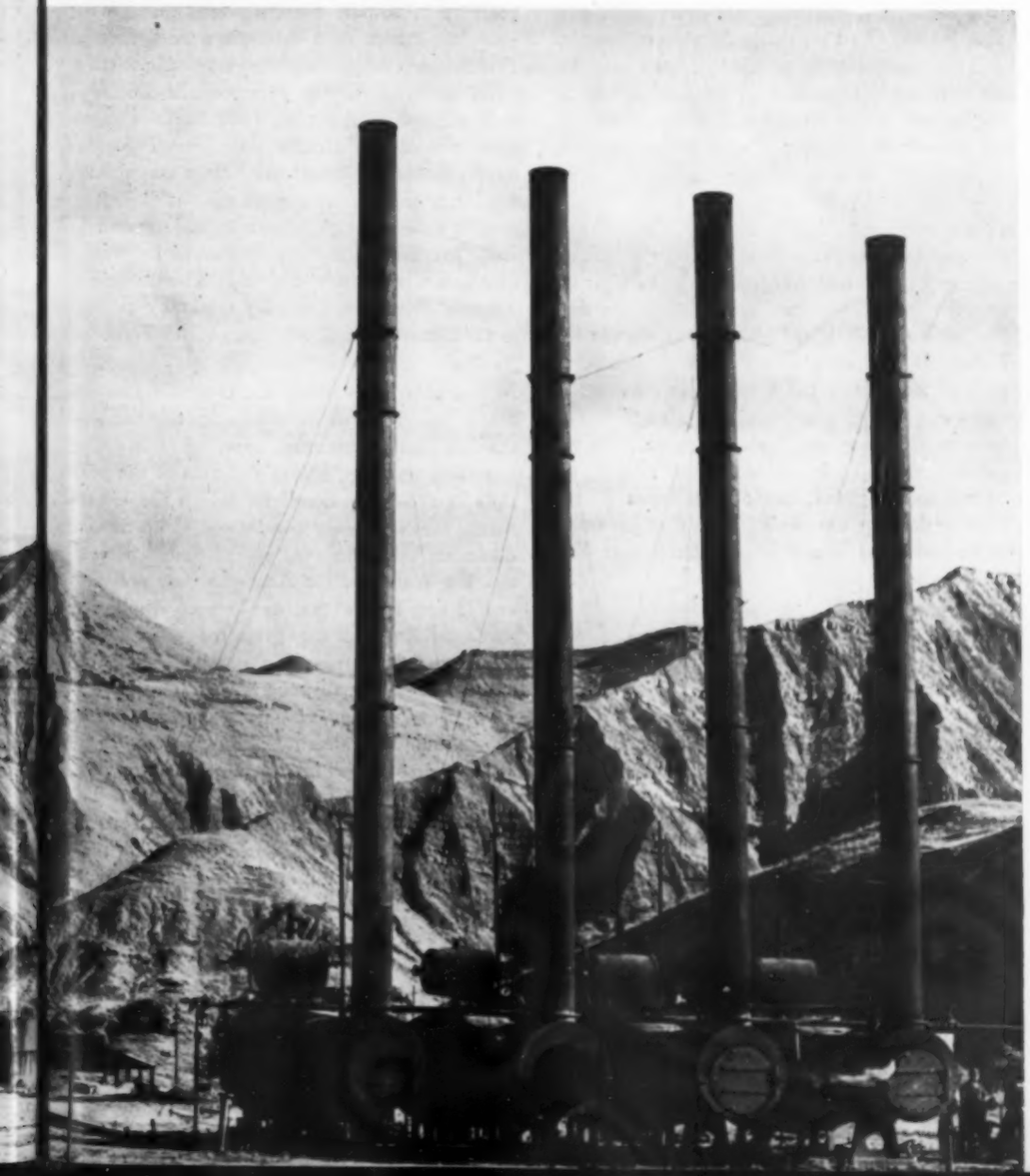
(2) Purchase by California-Texas Oil Company of the marketing and manufacturing facilities of The Texas Company in Europe and northern and western Africa. California-Texas is a subsidiary of Bahrein Petroleum Company which is jointly owned by The Texas Company and Standard of California. It was organized in 1936 to market the production of the parent companies from their holdings in Bahrein and Saudi Arabia in territories east of Suez including the Asiatic mainland, islands of the Pacific, South and East Africa and Australasia. Westward extension of its sales area will provide an outlet for oil to be transported to the eastern shore of the Mediterranean through the Trans-Arabian pipe line which is to be built by a subsidiary of Arabian-American.

(3) Agreement on the part of Standard Oil Co. (N.J.) and Socony-Vacuum Oil Company to purchase from Anglo-Iranian Oil Co. Ltd. an undetermined quantity of oil over a period of the next twenty years. As this also contemplates the building of a pipe line from Iran to the Mediterranean, it presumably is intended to enlarge the available supplies of Jersey Standard and Socony for European as well as for Far Eastern markets.

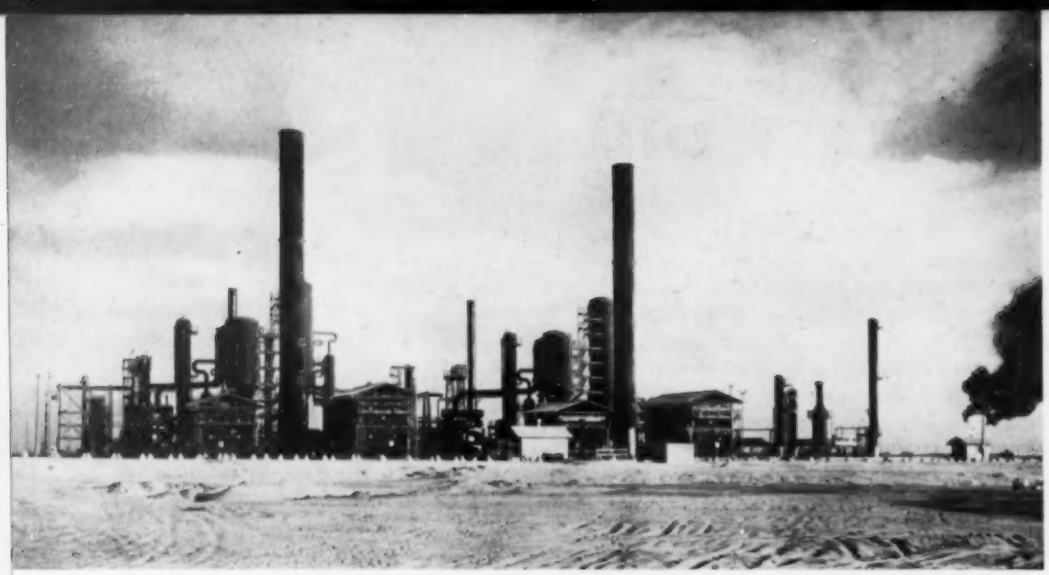
While these undertakings bear no direct relation one to another and at least one of them has been under consideration for a considerable time, they do establish a community of interest among the principal producing companies of the Middle East, the connecting factor being Standard Oil Co. (N.J.) and Socony-Vacuum. Through the Near East Development Company, they are one of five partners in Iraq Petroleum and its allied companies and will now become shareholders in Arabian-American and important customers of Anglo-Iranian.

One substantial Middle East producer not included in the pending agreements so far as announced is Kuwait Petroleum Company, Ltd., operating in the principality of Kuwait on the Persian Gulf. Since this company is owned 50 per cent by Anglo-Iranian, the other 50 percent belonging to Gulf Exploration Company, a subsidiary of Gulf Oil Corporation, it is conceivable that further agreements may provide for the disposition of its output.

Commercial production of oil in the Middle East dates back to the beginning of the present century when William K. D'Arcy obtained from the Shah of Persia a concession to explore a broad area in the southern part of that country. Out of that concession grew the Anglo-Persian Oil Company (now Anglo-Iranian Oil Company, Ltd.) which has developed a daily production of nearly 400,000 barrels and operates the world's largest refinery at Abadan. D'Arcy also sought a concession in upper Mesopotamia which at that time was a province nominally under Turkish control but poorly administered and badly neglected by the central government. D'Arcy's negotiations extended over several years and had reached the point where an agreement seemed about to be concluded when the overthrow of Abdul Hamid and the emergence of the Young Turk government took place. For the next few years an intermittent struggle for concessionary privileges was carried on between rival interests of which the most conspicuous were British and German groups, each of which had the support of its government's diplomatic representatives. American claims were represented by Admiral Colby M. Chester who previously had received promises of undefined concessionary rights. The Americans, however, received little support from their home government and fought a losing battle which, nevertheless, was maintained until the final settlement of claims by the Treaty of Lau-



field of South Iran. Anglo Iranian Oil Co. photograph.



Arabian American Oil Company's Ras Tanura refinery.

Crude stabilization plant of Iraq Petroleum Co.

His Majesty Abdul Aziz ibn Saud and his Crown Prince Saud ibn Abdul Aziz who is at present visiting the United States. Robert Yarnall Richie photograph.

sanne in 1923. Long before that time, in 1911, an attempt had been made under the leadership of Sir Ernest Cassel to combine the interests of rival claimants, and the Turkish Petroleum Co. Ltd. was organized under joint ownership of the National Bank of Turkey, the Anglo-Saxon Petroleum Co. (one of the constituents of the Royal Dutch-Shell Group) and the Deutsche Bank. This left out of account the D'Arcy claims supported by the Anglo-Persian Oil Company behind which the British government put its influence. As a result the 50 percent interest in Turkish Petroleum which had been held by the National Bank of Turkey was transferred to Anglo-Persian, the balance of the shares remaining in possession of Anglo-Saxon Petroleum and the Deutsche Bank.

Thus reconstituted the Turkish Petroleum Company, now having the support of both the British and German governments, renewed its efforts to win the long-sought authority to explore for Mesopotamian oil. Late in June, 1914, the Grand Vizier of Turkey, acting for his government, gave to the British and German ambassadors a written undertaking to lease to the Turkish Petroleum Company the exploitation of such oil deposits as might be found in the vilayets of Mosul and Baghdad, east of the Tigris River. Five weeks later the conflagration that has come to be known as World War I burst over Europe, putting an end to any hope of early implementation of the agreement. One immediate effect, however, was the sequestration by the Allies of the shares held by the Deutsche Bank.

When the war ended, Turkey's domination of the Mesopotamian area had ceased. The new kingdom of Iraq was set up embracing the areas covered by the commitment to the Turkish Petroleum Company. A new factor made its appearance in Middle Eastern affairs through the grant to France of a mandate over Syria and French assertion of a right to a voice in matters affecting that area. By an agreement concluded at San Remo on April 25, 1920, between representatives of the British and French governments, it was stipulated that France should have a quarter interest in any commercial company formed to exercise petroleum rights acquired in Iraq, but that such company should be permanently under British control. The shares of Turkish Petroleum Company originally allotted to the Deutsche Bank were assigned to France.

At this point the voice of the United States was heard. Secretary of State Hughes asserted that the San Remo agreement, applying as it did to mandated territory, was in violation of the principle of the "open door" for which the United States had vigorously contended. The ensuing discussion was protracted and at times acrimonious, but in the end the American view prevailed and it was agreed that one-half of Anglo-Persian's holdings in the projected oil company should be transferred to a group of American companies. As finally constituted, the Turkish Petroleum Company, now more appropriately renamed Iraq Petroleum Company, brought together four principal interests, each holding 23¾ percent of its shares, a total of 95 percent. The remaining five percent, consisting of shares without voting power, was assigned to Participations and Investments, Ltd., a company organized by C. S. Gulbenkian, Armenian financier, who, as one of the stockholders in the National Bank of Turkey, had aided in obtaining the original franchise. The other shareholders were:

Anglo Iranian Oil Company's Abadan refinery, largest in the world.

In the Kirkuk field, northern Iraq.

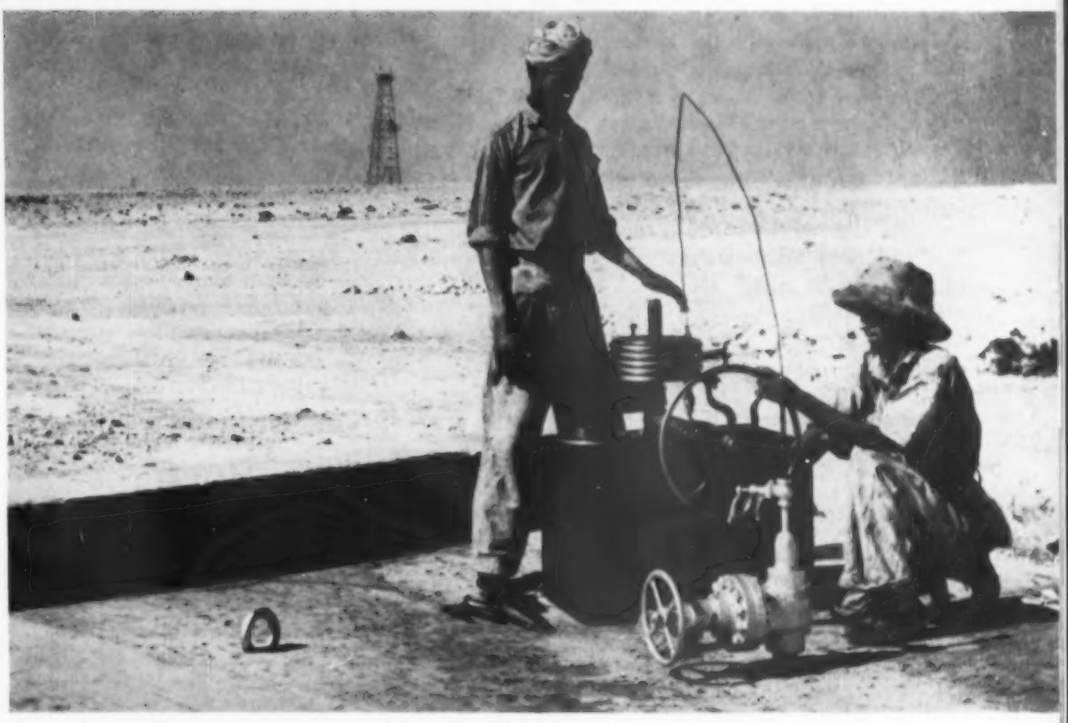
Bahrein Petroleum Company refinery on Bahrein island.

(1) The Anglo-Saxon Petroleum Company, one of the Royal Dutch-Shell Group. It had been one of the participants in Turkish Petroleum when that company was organized.

(2) The D'Arcy Exploration Company, owned by the Anglo-Persian (now Anglo-Iranian) Oil Company, in which the British government had acquired a majority interest at the time of World War I.

(3) Compagnie Francaise des Petroles, to which were transferred the shares originally assigned to the Deutsche Bank. It is a consortium of French financial and industrial interests and is often referred to as a government company because the French government is a chief shareholder.

(4) The Near East Development Corporation, originally formed as a holding company for shares allotted to Standard Oil Company (N.J.), Standard Oil Company of New York (now Socony-Vacuum), Pan American Petroleum and Transport Company (Standard of Indiana), Atlantic Refining Company, Gulf Refining Company, Sinclair Consolidated Oil Company and The Texas Company. Sinclair and Texas did not join the enterprise, and the number of shareholders has since been reduced to two thorough purchase by Jersey Standard and Socony-Vacuum of the other holdings.



Bahrein Petroleum Company's discovery well being tested for gas pressure.

After validating its concession by a new agreement with the Kingdom of Iraq, the reorganized company began drilling in April, 1927, and in the following October brought in its discovery well, the celebrated Baba Gurgur which flowed 60,000 barrels a day and formed a huge lake of oil before it was brought under control. A number of additional wells were quickly drilled, confirming the position of Kirkuk as a highly productive field. To provide an outlet for the oil, a pipe line nearly 1200 miles in aggregate length was laid across the desert from Kirkuk to Haditha where it forked into two sections, one extending across Syria to the port of Tripoli on the Mediterranean and the other extending southwesterly across Trans-Jordan and Palestine to deep water at Haifa. The line was completed in 1934 with a daily capacity of 80,000 barrels. Work is now beginning on a new line paralleling the existing route which will triple present capacity.

While the task of developing oil production in Iraq was progressing, exploration was under way on the island of Bahrein where Standard of California in 1930 took over a concession previously held by Gulf Oil Corporation and organized Bahrein Petroleum Company, Ltd., to develop it. Production on Bahrein started in 1933, and the first cargo of oil was shipped in June of the following year. In 1936 a refinery was built which has undergone successive enlargements to a throughput capacity of 115,000 barrels daily.

In the meantime a spirited competition had been going on for a concession in Arabia where Adbul Aziz Ibn Saud, King of the Wahhabi, had consolidated his control of the greater part of the peninsula. It was quite understandable that California Standard, having established itself on Bahrein, should desire to extend its operations to the mainland, while members of Iraq Petroleum felt that this was a logical theatre for its own expansion. In the final outcome, the King decided in favor of the Americans, and in 1933 signed a concession granting full rights to explore, produce, transport, refine and export oil from an area covering the entire eastern part of his dominion. Exploratory drilling at Dammam, later extended to other fields along the eastern side of the peninsula, revealed the existence of one of the largest petroleum deposits ever located. Progress of development was hampered during the war years by scarcity of materials and lack

of shipping. In 1945 a refinery with a rated daily capacity of 50,000 barrels was erected by Arabian American Oil Company at Ras Tanura, to supply petroleum products to Allied ships and armies operating in that part of the world.

Saudi Arabian production is now about 200,000 barrels daily, but its potential is many times that amount. The first production developed on the concession was at Dammam where 34 wells are now in operation. A field of even greater potential is that at Abqaiq where 10 wells have been put down thus far. Each of these fields is producing approximately 100,000 barrels daily. In addition there is one well at Qatif yielding about 3,500 barrels daily. These fields are within a relatively short distance from the refinery at Ras Tanura with which they are connected by pipe line. The major part of Arabian-American's holdings have not yet been explored.

To provide a westward outlet, a pipe line, which may be the world's largest in point of capacity, is to be built across Arabia to a point on the eastern shoreline of the Mediterranean. Several routes have been surveyed, and permission to cross the intervening countries has been obtained, but final decision as to the exact location of the Mediterranean terminal has not been announced. A few years ago Arabian-American, by a further agreement with King Ibn Saud, obtained preferential rights extending over practically the whole territory under his authority.

Lying between Arabia and Iraq, on the upper reaches of the Persian Gulf, is the small Sheikdom of Kuwait. A concession covering this territory was obtained by Gulf Exploration Corporation and Anglo-Iranian Oil Company in December, 1934, and Kuwait Oil Company, Ltd., was organized under their joint ownership. Production was established in 1938, and subsequent drilling defined the field as one of high potential with known reserves estimated by independent geologists as high as ten billion barrels. During World War II development work was practically suspended. Nine wells have been drilled all of which are active producers. A short pipe line has been laid from the Burgan field to the shipping terminal at Fahaheel on the Persian Gulf, through which approximately 40,000 barrels are being delivered daily and transported by tankers to refineries in the Mediterranean and western Europe. Seven drilling rigs have been shipped to Kuwait and are expected to increase production substantially during the coming year.

As previously related, the Iraq Petroleum Company's concession as finally confirmed by the government of King Faisal was limited to the district east of the Tigris. About the time when the construction of the desert pipe line began, the British Oil Development Company obtained a concession covering some 40,000 square miles lying west of the Tigris and extending northward from the thirty-fifth parallel to include the area about Mosul where shallow wells drilled in earlier years by the Germans had revealed the presence of oil. The ambitious plans announced for the B. O. D. were never realized, and after various changes in management, it was acquired by the interests comprising Iraq Petroleum and reorganized as Mosul Oilfields Ltd. The Iraq group also organized the Basrah Petroleum Co. Ltd., which obtained a concession covering southern and western Iraq and formed a number of other companies which acquired concessions in Palestine and Cyprus and in several small principalities along the coast of the Arabian peninsula. These companies include:

Petroleum Development (Qatar) Ltd.
" " (Trucial Coast) Ltd.
" " (Oman and Dofar) Ltd.
" " (Hadramaut) Ltd.
" " (Western Arabia) Ltd.
" " (Transjordan) Ltd.
" " (Palestine) Ltd.
" " (Cyprus) Ltd.
Syria Petroleum Co., Ltd.
Lebanon " " "

These companies are not classed as subidiaries of Iraq Petroleum but are owned by the several Iraq partners in the same proportions as their holdings in that company. The only district in which development thus far has advanced to the

(Please turn to page 34)

THE RED LINE AGREEMENT

The agreement to which this designation has been given, because the area to which it applied was indicated by a red line drawn on the map which accompanied it, dates back to July, 1928, when the Iraq Petroleum Company was established under its present ownership. It was a self-denying ordinance adopted by the shareholders of the company, by which they bound themselves not to undertake individual operations in the areas within the red line as shown on the accompanying map except with the approval of the other members of the group. The territory involved included Iraq itself, Saudi Arabia, Palestine, Trans-Jordan, Syria and Turkey, virtually the Ottoman Empire as before World War I.

In the opinion of British legal experts, which apparently coincides with the position of the British government, the agreement ceased to apply when France became enemy territory following its occupation by Germany. The French company, which is one of the shareholders of Iraq Petroleum, maintains that the agreement is still binding and that is the basis of the court proceeding which the company has begun.

Contrary to what appears to be a widespread impression, the Red Line agreement has nothing to do with marketing and imposes no restrictions upon competition in the sale of products by the companies concerned.

OIL CONCESSION DATA

(Numbers refer to accompanying map)

1. Petroleum Development Ltd.
Affiliate of the Iraq Petroleum Co.

2. Arabian American Oil Co.

Concession:
Term—Original area 60 years from July 14, 193
Additional area, 60 years from July 14 1939
Area—281,280 acres

Ownership:

Standard Oil Co. of California	50%
The Texas Company	50%

3. Kuwait Oil Co., Ltd.

Concession:
Term—75 years from Dec. 23, 1934
Area—all of Kuwait

Ownership:

Anglo-Iranian Oil Co. Ltd.	50%
Gulf Exploration Co.	50%

4. Anglo-Iranian Oil Co. Ltd.

Concession:
Term—60 years from Dec. 31, 1933
Area—64,000,000 acres

Ownership:

British Government	55.9%
Burmah Oil Co., Ltd.	26.3%
Others (individuals)	17.8%

5. Basrah Petroleum Co. Ltd.

Concession:
Term—75 years from Dec. 4, 1938
Area—All of Iraq not covered by I.P.C. and B.O.D. concessions

Ownership:
Members of Iraq Petroleum Co.

6. Mosul Oilfields Ltd. (B.OD)

Concession:
Term—75 years from July 3, 1933
Area—All of Iraq west of Tigris and north of 33° latitude (approximately 26,000,000 acres)

Ownership:
Controlled by Iraq Petroleum Co.

7. Iraq Petroleum Co.

Concession:
Term—75 years from March 14, 1925
Area—Provinces of Bagdad and Mosul, east of Tigris River

Ownership:

Shell	23.75%
Anglo-Iranian Oil Co. Ltd.	23.75%
C.I.E. Francaise Petroles	23.75%
Standard Oil Co. (New Jersey)	11.875%
Socony-Vacuum Oil Co., Inc.	11.875%
Private interest (C. I. Gulbenkian)	5%

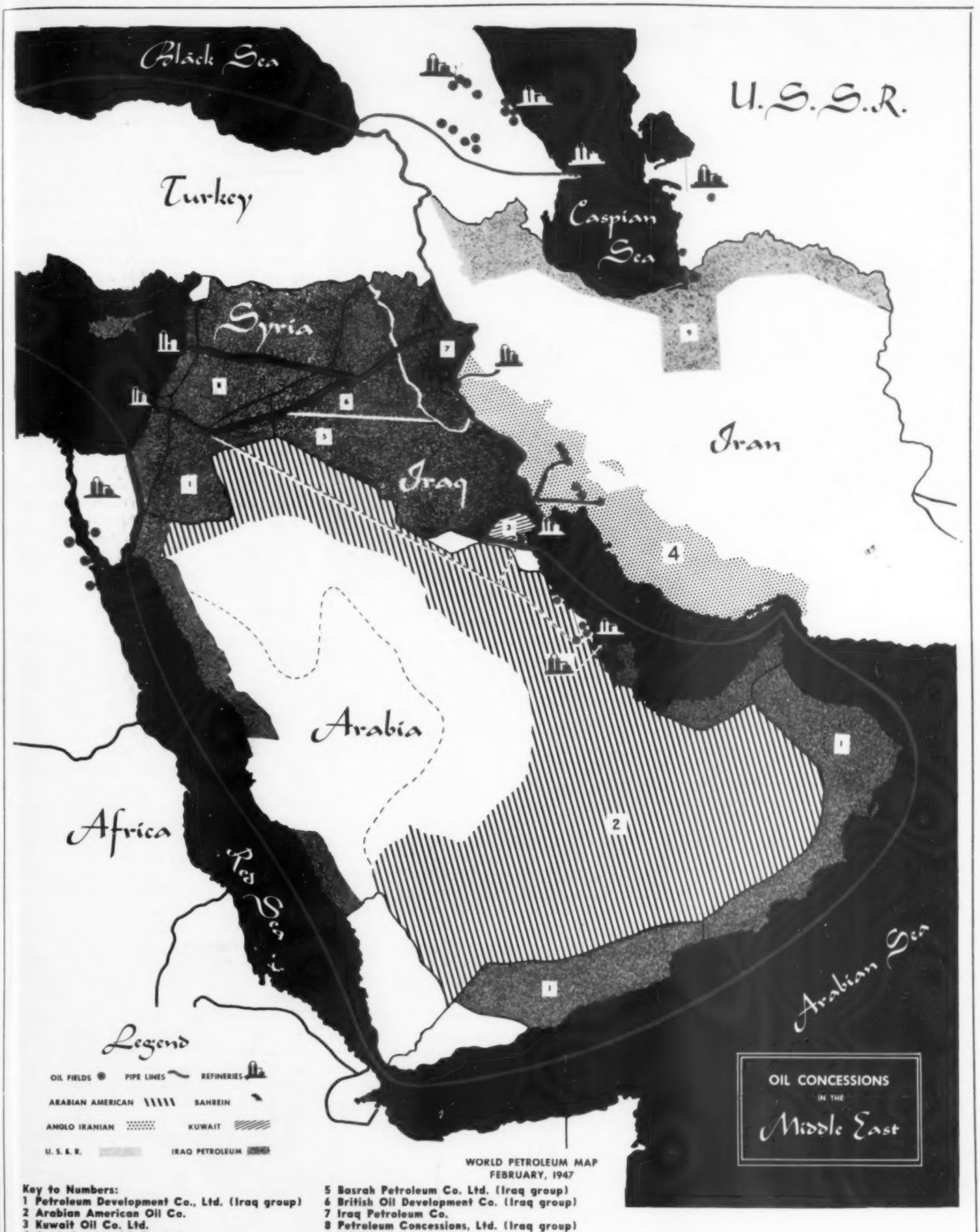
8. Petroleum Concessions Ltd.
Affiliate of Iraq Petroleum Co.

9. Iranian concession to U.S.S.R.
Bahrein Oil Co. Ltd. (Not Numbered)

Concession:
Term—55 years from June 19, 1940
Area—All Bahrein Islands and territorial waters

Ownership:

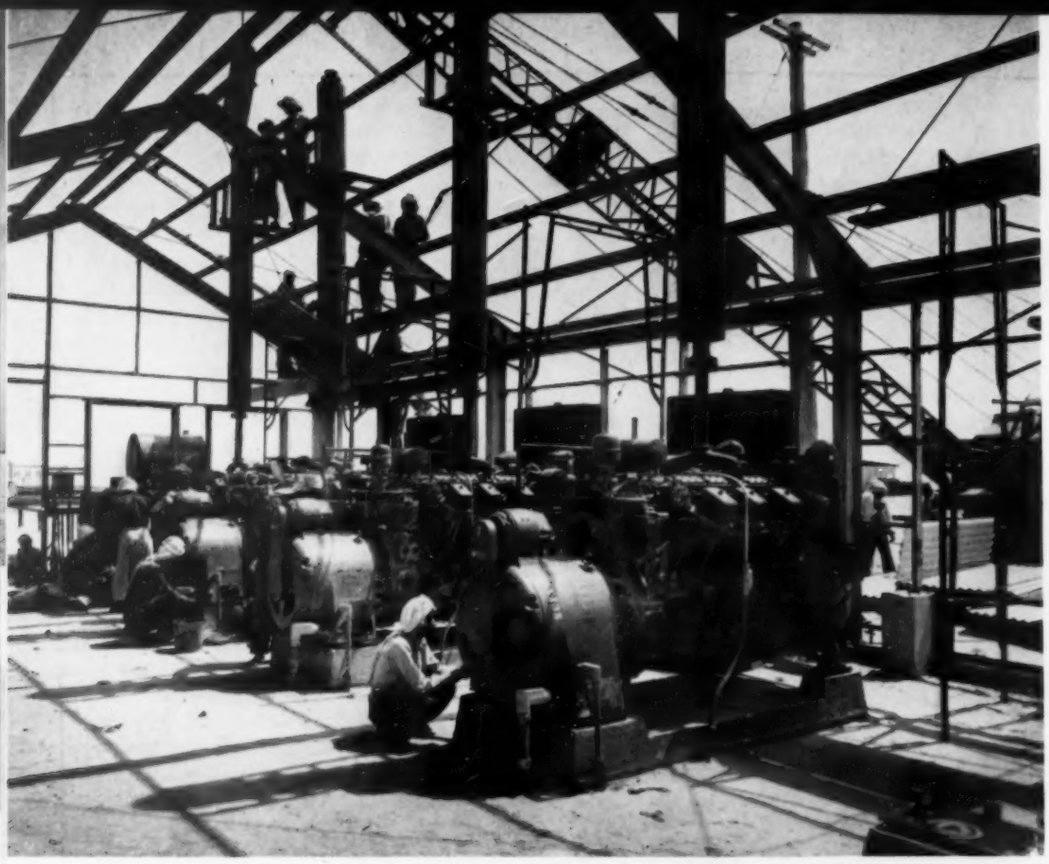
Standard Oil Co. of California	50%
The Texas Company	50%



WORLD PETROLEUM MAP
FEBRUARY, 1947

Key to Numbers:

1 Petroleum Development Co., Ltd. (Iraq group)
2 Arabian American Oil Co.
3 Kuwait Oil Co. Ltd.
4 Anglo-Iranian Oil Co. Ltd.
5 Basrah Petroleum Co. Ltd. (Iraq group)
6 British Oil Development Co. (Iraq group)
7 Iraq Petroleum Co.
8 Petroleum Concessions, Ltd. (Iraq group)
9 U.S.S.R. Concession



Pump house under construction at Abqaiq, a station on the Arabian American Oil Co. line to Dahrahn.

point of actual production is Qatar, a projection from the mainland on the western side of the Persian Gulf, where a good-sized well was brought in about the beginning of World War II and where indications point to a field of substantial size.

Holdings of the companies named embrace a good part but by no means all of the Middle Eastern territory that is looked upon as being favorable to the production of petroleum. As has been pointed out, ownership is divided among American, British, Dutch and French interests. In addition the Soviet Union is in process of acquiring a concession extending across northern Iran, and there is a large area in the central part of that country on which concessionary rights have not been allotted. From the standpoint of international trade, however, the important factors so far as Middle East oil is concerned for the immediate future and probably for a long time to come are likely to be the Arabian-American and Bahrein companies on the Arabian peninsula, the Anglo-Iranian in Iran, Kuwait Oil Company in the Sheikdom of that name, and Iraq Petroleum Company with its satellites.

Native workers have proven efficient in many mechanical operations in the Middle East. California Texas Oil Co. Ltd., photograph.

Crude oil production of these companies is now of the order of 700,000 barrels daily, but this obviously is no criterion of their potential output or of the actual production that will begin as soon as certain facilities for movement of its oil, which are now projected or in course of construction, are completed. Among these is the enlargement of the Iraq pipe line by laying a 16-inch main along the existing right of way. When completed it will raise the daily capacity to 250,000 barrels which the Kirkuk field can readily supply.

In the announcement of the agreement between Standard Oil Company (N.J.) and Socony-Vacuum for the purchase of crude oil from Anglo-Iranian, it was stated that this agreement contemplated the construction of a pipe line from Iran to the Mediterranean. It was also stated that one purpose of the arrangement was to enlarge the available supply of crude for the Standard-Vacuum Oil Company which, even before the war, had insufficient production to supply its markets in the Middle and Far East. These statements obviously forecast an increased production in Iran once purchases begin, since the refinery at Abadan is able to handle the current output from its fields.

Projected construction of the Trans-Arabian pipe line to convey oil from the Arabian fields to the Mediterranean has been widely publicized, and the undertaking has advanced to a stage where the building of the line can begin as soon as materials are obtainable. Inclusion of Jersey Standard and Socony-Vacuum as participants in ownership of the line may be expected to simplify the financing of the undertaking, the cost of which has been estimated at a possible $200,000,000 including refining and port facilities. Erection of a refinery at the Mediterarrean terminus of the line is part of the plan. Proposed capacity of the Trans-Arabian will be greater than that of any oil line heretofore built and will provide opportunity for more than double the present production of Arabian oil which is now limited by the capacity of the refineries at Ras Tanura and Bahrein.

Execution of these plans in their entirety will require several years, but when completed they will call for the production of upward of 1,500,000 barrels daily from Middle East fields. They likewise will make this region one of the great refining districts of the world. In addition to the plants to be erected in connection with the Trans-Arabian and Iran-Mediterranean pipe lines, the capacity of Consolidated Refineries at Haifa is being enlarged to handle the larger quantities of crude that will be delivered when the southern fork of the new Iraq pipe line is finished. Other refining facilities for handling Middle East oil are under discussion, but the plants already decided upon, with those now in operation, will be able to handle probably 750,000 or more barrels daily.

The question of where this greatly enlarged supply is to find its market is one that is being discussed with deep interest by oil men everywhere. In the statement issued by Standard Oil Company (N.J.) confirming its pending agreements with Anglo-Iranian and Arabian-American, the answer given was as follows:

"The two proposals are aimed at bringing Jersey's future crude oil supply position in the European areas gradually into balance with its expected market demands. Affiliates of the company now supply some 20 percent of this market, primarily from the Western Hemisphere since the company now has considerably less than five percent of Middle East crude oils to supply this market. Anticipated pressure on Western Hemisphere crude oil supply, which over the next two decades is expected to be about equaled by the increasing Western Hemisphere demand, would thus be relieved by gradually substituting Middle East for Western Hemisphere crudes. Another result of these proposals would be to make crude oil available to Standard-Vacuum Oil Company, a 50-percent owned Jersey affiliate with producing, refining, and marketing operations in the Far East. This would materially strengthen Standard-Vacuum's position, as this

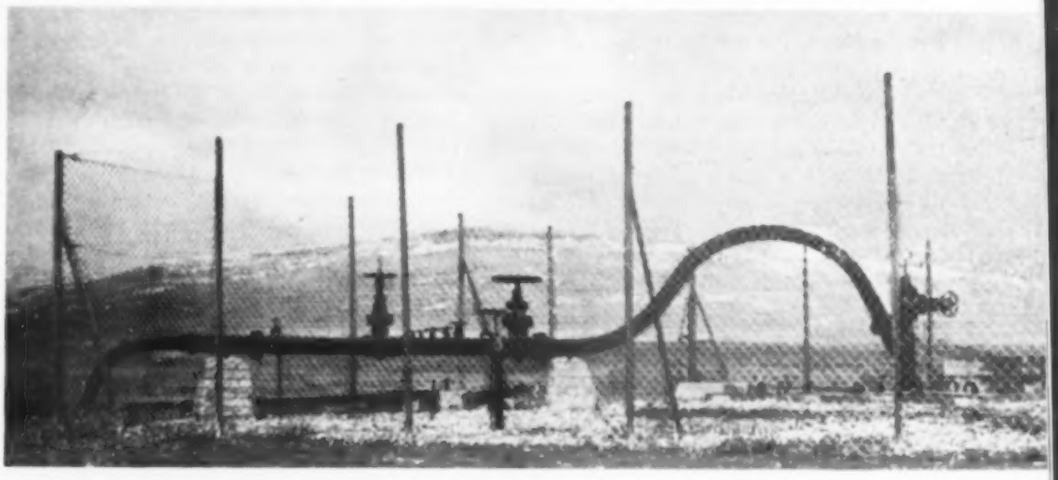
company before the war produced oil only in the Netherlands East Indies, and this production was never sufficient to meet the market demand in the Far East. It is expected that this increase in crude oil supply will require some increase in refining capacity of Jersey Company affiliates in the European area, but there are no definite plans in this connection as yet."

The statement of Socony-Vacuum covered practically the same ground, pointing out that the company's only source of crude for the Middle East at present consisted of its share of Iraq petroleum amounting to approximately 10,000 barrels daily. Socony-Vacuum's former properties in Poland, Czechoslovakia and Yugoslavia have been lost as a result of the war, and the status of some of its facilities in western Europe is uncertain.

Estimation of future consumption of petroleum products in the Eastern Hemisphere is a highly problematical undertaking. Computations of well-known economists published in WORLD PETROLEUM in September last placed requirements in 1950 at roundly 2,000,000 barrels daily, exclusive of the Soviet Union which was assumed to be neither an exporter nor importer. As the statement quoted above from Standard Oil Company (N.J.) indicates, its officials are preparing their plans in terms of the needs of the next twenty years, by the end of which time the demands of the eastern half of the world may very well have doubled.

Quajaraia camp of Seismograph Service Corporation in Iran. ↑

Typical well head hook-up in the Kirkuk field protected from casual tampering by a high wire fence. ↓



Dahrahn camp of Arabian American Oil Company. Messhall, swimming pool and recreation grounds are shown in foreground.

OIL COMPANIES REGAINING PACIFIC TRADE

DISTRIBUTION of petroleum products in areas of the Pacific which were under Japanese domination during the war is gradually being restored to normal channels. In Japan itself and in Korea, the military still controls the purchasing of petroleum supplies and their allotment to specific uses. Even here, however, the army command has enlisted the services of oil men drawn from private industry to direct the handling of products.

In other regions of the Pacific, except those sections still blocked against access because of internal conflicts, the restrictions imposed during military control have been lifted, and representatives of the oil companies formerly doing business there are back at their posts and are reestablishing trade facilities and connections disrupted by the war. Demand is surprisingly good considering the completeness of the dislocation of industrial activities at the time of the Japanese evacuation. In the Philippines, for example, practically every vestige of the oil industry had been erased. Now companies are getting their stations and trucks in shape to provide service to their customers, and the situation is steadily improving.

Restrictions upon commercial operations in Chinese port cities recently were removed, and private companies are moving their products to these ports and to points in the interior where transportation is still difficult. Because of the inflation from which China is suffering and the scarcity of foreign exchange, licenses are still required for imports which are limited to urgent necessities. These monetary difficulties are the chief obstacles to the petroleum trade. Though prices are extremely high, measured in Chinese currency, as much as $1,500 having been paid for a single truck tire, needs are so urgent as to overcome this handicap to some extent.

Conditions in Japan are different from those existing in other areas. Control of petroleum supplies is still exercised by SCAP (Supreme Commander Allied Armies), and distribution for civilian use is in the hands of an agency operated by native companies that were similarly engaged in the prewar period.

With the outbreak of hostilities in 1941, the properties of foreign-owned companies operating in Japan were seized by the government. Handling of the meagre supplies allowed for non-military use remained in charge of Sekiyu Kyohan K. S. (Petroleum Joint Sales Company) as sole survivor of the three government-authorized distributors. The company was capitalized at 40,000,000 yen, its constituents being the major Japanese refining companies, Mitsubishi Shoji, Mitsui Bussan and nearly 4,000 dealers. In March, 1944, this company was dissolved and was succeeded by Sekiyo Haikyu Tossi K. Kaisha (Petroleum Distribution Control Company, Ltd.) which had its head office in Tokyo with eight branch offices in different sections of the country and representatives in each prefecture.

PDCC was nominated an official control company, and by Ordinance No. 56 of the Ministry of Commerce and Industry was appointed sole distributor of petroleum products in Japan. It absorbed the assets of Sekiyu Kyohan, and to a considerable extent the officers of that company succeeded to similar appointments in PDCC. Sekiyu Kyohan, and later PDCC, offered employment to the majority of the Japanese staff of the foreign oil companies. By authority of the Ministries of Finance and Commerce, through forced purchase or "lease," the greater part of the assets of those companies were taken over.

Following the surrender and occupation of Japan by American forces, the military authorities took control of petroleum supplies. These consisted of the small output of domestic refineries, imports sanctioned by the Supreme Commander Allied Powers and, temporarily, recaptured Japanese military stocks. All Japanese petroleum stocks were considered booty and reverted to the military of the occupying powers. Then the stocks were released to the Japanese government for civilian use, the army keeping strict account of their distribution, just in case it should be decided to figure them in the reparations.

Stock balances of Japanese refineries held on the Pacific Coast also were liquidated for civilian consumption. Distribution of available supplies was required to conform to the overall rationing scheme, for which the Japanese Ministry of Commerce was held responsible. SCAP decided the quantities Japan could have, and Japanese authorities were directed to parcel it out in a way that would best serve the civilian economy Under this arrangement PDCC as the distributing agency received a commission on sales out of which transportation, operating and overhead expenses had to be paid.

In the beginning all gasoline, furnace oil, paraffin wax and asphalt, nearly all lubricating oil and some part of other liquid products distributed by PDCC came from Japanese sources. Domestic production was only a fraction of total requirements, and with the exhaustion of accumulated stocks, it was necessary for petroleum needs to be met more and more from imported supplies. SCAP paid particular attention to providing enough diesel fuels to keep the fishing boats going and enough for transportation to keep the economy running in the low gear to which it had been reduced by the disorganization attending the war.

From the start of the occupation, the policy adopted by the Allied Powers was that there were to be no private independent commercial transactions between Japanese nationals and those of foreign countries. All imports and exports were arranged, controlled, regulated and accounted for between the Import and Export Division of the Economic and Scientific Section of SCAP and the Board of Trade (Boeki-cho) of the Ministry of Commerce and Industry of the Japanese government.

Because of the unfamiliarity of military personnel with the handling of oil products, an organization known as Josco (Japan Oil Storage Company) was set up as of November 1, 1946. This is comprised of five companies which supplied the greater part of Japan's import prewar — Shell, Standard-Vacuum, California-Texas, Tide Water Associated and Union, each having a 20 percent interest.

An an oil enterprise, Josco probably is unique. It is a non-profit organization. It neither buys nor sells the products its handles. SCAP still buys whatever supplies are needed for its own requirements and also such amounts as it may decide to release for civilian use. Purchases are not necessarily made from the companies comprising the group; the army buys wherever it is most convenient. Josco takes over these supplies, moves them to storage facilities formerly used by the army and assigned for this purpose. Later it makes deliveries as specified on orders from SCAP. Josco is staffed by experienced oil men who are loaned by the five constituent companies and paid by them. For its services it receives a throughput charge per barrel which is just about sufficient to defray expenses.

PDCC has continued to distribute products destined for civilian consumption including indigenous production. Recently, however, it has been reorganized, and a new corporation has been set up. This is a government controlled monopoly. When economic conditions permit it presumably will be dissolved or become a privately-owned company, and the foreign companies formerly doing business in Japan will be readmitted. It is the purpose ultimately to reestablish free enterprise and competitive conditions.

As Japan's economy is rebuilt, the use of petroleum products is increasing. Monthly distribution rose from 30,000 kiloliters at the beginning of 1946 to some 80,000 at its close and is expected to continue its gain.

In the American zone of Korea, conditions are again different. The Petroleum Distributing Agency has been formed, operated by men drawn from American and British private companies and attached to the military government. As there are no bulk facilities fuel is shipped in drums from Yokohama by Josco for distribution in Korea.

ECONOMICS OF COLOMBIAN OIL INDUSTRY

By E. OSPINA-RACINES

DATA published by the Colombian government and compiled by the author cover the operations of the oil industry and its fiscal relations to the government up to 1945. They provide a basis for study which may serve to orient the future oil policy of the country which is now under consideration, with the ultimate objective of encouraging the expansion of oil production and enabling it to contribute additional revenues to the State, while permitting Colombian exports to maintain their position in competition with low-cost oil from the Middle East which is being made available in increasing quantities on the world market.

Oil and Fiscal Revenues

First export shipments of Colombian oil took place in 1926. As shown by the Minister of Petroleum's report to Congress, oil revenues in that year amounted to Ps 842,340 or 1.4 percent of the total fiscal income of Ps 60,648,914. In 1936 when the new income tax law went into effect, oil fiscal revenues reached 10.4 percent of the total fiscal income. Twenty years after the first oil shipments to the world market, the government income, consisting of royalties, income taxes, exploration fees, pipe line rights and miscellaneous taxes, totaled Ps 11,710,962 exclusive of consumption taxes, equalling six percent of total revenues of Ps 196,830,297. Government income based on the 22,825,027 barrels of oil exploited amounted to 29.24 cents U. S. currency per barrel. This figure compares to similar per barrel revenue obtained in Venezuela, Trinidad and in the Middle East countries, which are understood to average currently around 30 cents U. S. per barrel exploited.

Under the income tax law of 1936 creating additional capital assets and excess profits levies, oil industry income taxes have been much larger than royalty payments. In 1945 royalties yielded the government Ps 3,746,870, whereas income taxes totaled Ps 7,234,000, or a ratio of one to 1.95. The 10-year period 1936-1946 reveals an average of one to 2.6, indicating that income tax payments yielded the fiscal in general 2.6 times the royalty revenue. For 1945 the overall royalty per barrel of oil exploited amount to 9.4 cents, whereas income taxes yielded 18.5 cents or 32 and 63 percent respectively of the fiscal oil income. In the light of these data, the proposed increases in the oil royalty tariff as contained in the various oil bills submitted to Congress are not justified. In 1944 when the oil industry suffered a decided drop in its income, the ratio was one to .08, whereas in 1942 the royalty income tax ratio reached once to 6.1. The income tax set-up is flexible whereas the fixed royalty is a levy on the gross income and is uneconomic.

It is significant that the government income derived directly from oil in 1945 accounted for six percent of the gross income which amounted to Ps 29,219,000 ($16,655,000), whereas the net taxable income was Ps 17,916,000 ($10,212,000), and the income tax paid by the oil industry amounted to Ps 7,234,000 ($4,123,380) or 40.2 percent of the net taxable income. Even if the oil industry had paid the balance 100 percent of the net taxable income, the six percent mentioned above would have increased only to 11.4 percent. It is evident that with increased government expenditures (the 1947 budget places these at Ps 291,000,000 as against 1945 actual revenues of Ps 197,000,000), the oil industry may contribute in a greater proportion to the fiscal income only by increasing the oil output of Colombia and not by higher royalty or tax rates. In 1939 Colombia's crude oil output, identified principally with the De Mares concession which reached its peak in that year, averaged 65,376 barrels per day, and in 1940, Colombia's peak production year, the figure was 70,040 barrels per day. During the 12-month period ending October, 1946, Colombia's crude oil production averaged 64,625 barrels daily. Crude oil production had not increased during the intervening period, although there are five commercial oil fields in production as against two in 1939 and three in 1940.

Whereas only six percent of the fiscal income was derived directly from oil in 1945, 100 percent of the wages and salaries of the 14,980 oil industry workers and employees was paid by oil. The outlay totaled Ps 30,263,487 $17,250,188, and represented 75.6 cents U. S. per barrel of oil exploited. Of this 55.4 cents were paid to Colombians and 20.2 cents to foreign personnel. For 1945 the Colombian oil industry obtained a yield of 1,524 barrels of oil per employee. Comparable data appearing in PETROLEO DEL MUNDO of June, 1946, for Venezuela and Mexico reveal 10,410 barrels of oil per employee in Venezuela and 2,347 barrels per employee in Mexico.

According to the annual statistical year book of Colombia, 2,467 tons of oil well drilling equipment were imported in 1945, valued at $2,356,063. Many kinds of machinery and transport mechanisms not entered under "drilling equipment" were imported by oil companies. During the 12-month period ending October 1946, the oil industry imported a total of 61,344 tons valued at $15,685,143. The 1945 capital investment represents 10.32 cents per barrel of oil exploited based on incomplete data. The 1946 figure cited represents 66.5 cents U. S. per barrel of oil exploited. To maintain the oil exploratory and development program, the oil industry brought into the country $31,929,755 in cash in 1945, equal to $1.40 per barrel of oil exploited. The 1946 currency imports totaled $33,211,733, representing 12.5 percent of Colombia's total dollar exchange obtained, the greatest part of which was derived from coffee exports.

Of Colombia's 1945 crude oil production, 19,487,139 barrels or 85 percent was exported and brought a world market weighted average price of $1.14 per barrel. This value was absorbed by the following items: (1) government oil income of 29.24 cents per barrel; (2) wages and salaries paid to the Colombian oil personnel, 55.44 cents; (3) the same paid to foreign personnel, 20.14 cents; (4) imports of oil drilling equipment, 10.32 cents; total, $1.15 per barrel of oil exploited. The net taxable income of the Colombian oil industry for the same year amounted to 45 cents per barrel of oil exploited. In view of imports valued at $1.40 per barrel, it is evident that at present Colombian oil, on the whole, is yielding a net deficit and that this uneconomic status cannot be maintained but should be replaced by a better balanced economy to be attained through greater government encouragement to the oil industry.

Summary of Oil Income and Outlay

Item		Pesos	Dollars	US Dollars per bbl. output
Government Income—Oil	Ps	11,710,962	$ 6,675,248	$0.2924
Paid to Colombians—Wages		22,198,430	12,653,105	.5544
Paid to foreigners—Wages		8,065,057	4,597,083	.2014
Imports of oil equipment		4,133,444	2,356,063	.1032
Sub-total	Ps	46,107,893	$26,281,499	$1.1514
Oil cash imports		55,877,071	31,929,755	1.4000
Value of oil exports		39,008,400	22,234,789	
1945 Net Taxable Income		17,916,000	10,212,120	.4474

SECOND BAKU AIDS SOVIET PRODUCTION

By L. TOKAROVA

Oil barge on the Volga near the Zhiguli field.

DURING the war, with the Maikop oil fields seized by the Germans and the Baku and Grozny regions threatened and cut off, the "Second Baku" sustained the country's industry and armed forces. This oil-bearing area covers an immense territory, embracing the square formed by the cities of Kirov, Molotov, Chkalov and Saratov, in the area between the Volga and the Ural Mountains.

This new oil field cannot replace the Baku fields of the Caucasus which still rank first in view of the fact that their resources are measured by thousands of millions of tons, and the new oil-bearing strata there are still being discovered. But the "Second Baku" is of tremendous importance in Soviet economy because it brings an oil supply much nearer to some of the large consumption areas, both agricultural and industrial.

Discovery of the Volga-Ural oil field was made in April of 1929. A pit hole sunk in Verkhne-Chussovskiye Gorodky in a search for salt gave showings of oil. In the history of the industry of the Soviet Union, this was comparable to Drake's discovery in Pennsylvania in 1859, which started the enormous development of the oil industry in the United States. Investigations by geologists continued through the nineteen-thirties until the extent of the oil fields was determined. These geologists found oil in Devonian strata at a number of points between the Volga and the Urals. These strata, lying at great depths, are spread over a vast territory. Now, Devonian oil is being extracted both in Bashkiria on the Volga and in the Molotov Region.

Under the recently announced new Five-Year Plan, development of the "Second Baku" will continue to expand, with 1950 output exceeding that of 1940 by more than ten times in the Volga district and more than four times in the Urals sector. Even as far back as 1938, the oil output of the "Second Baku" was close to a million and a half tons per year.

The Volga sector of the "Second Baku" is of exceptional importance since the Volga river, meandering and twisting throughout the whole area forms the main artery of supply and transport. New pipe lines from the vast new oil area will lead to the Volga so that tankers can load and unload oil with dispatch, thus supplying tremendous impetus to the industry of the whole region. Construction of pipe lines, refineries and cracking plants has begun and will keep pace with the development of the oil-bearing area.

New roads have been built from the oil areas to administrative centers and large towns. Whole villages have been constructed for the army of workers who have come from all other parts of the Soviet Union. As is true of all Soviet industries since the war years, the workers are predominantly young and a large proportion of them are women. Most of them arrived at the oil fields with no previous training or experience in the oil industry and had, therefore, to be trained on the job. This type of training program will be continued for some

Oil workers' homes in the new oil town of Devonsk.

time until a corps of experienced oil workers is developed.

The region around Kuibyshev, in the Samara Bend of the Volga River, is especially productive. Wells have been and are being drilled in the Zhiguli Hills near the wartime capital of the Soviet Union. Within a short time four new oil fields have been put into operation in this region, the production of gas has been organized and two cracking plants have been built. The result is that a five-fold increase has been effected in the production of oil from this one region alone as compared with pre-war volume, and the future holds out still greater promise.

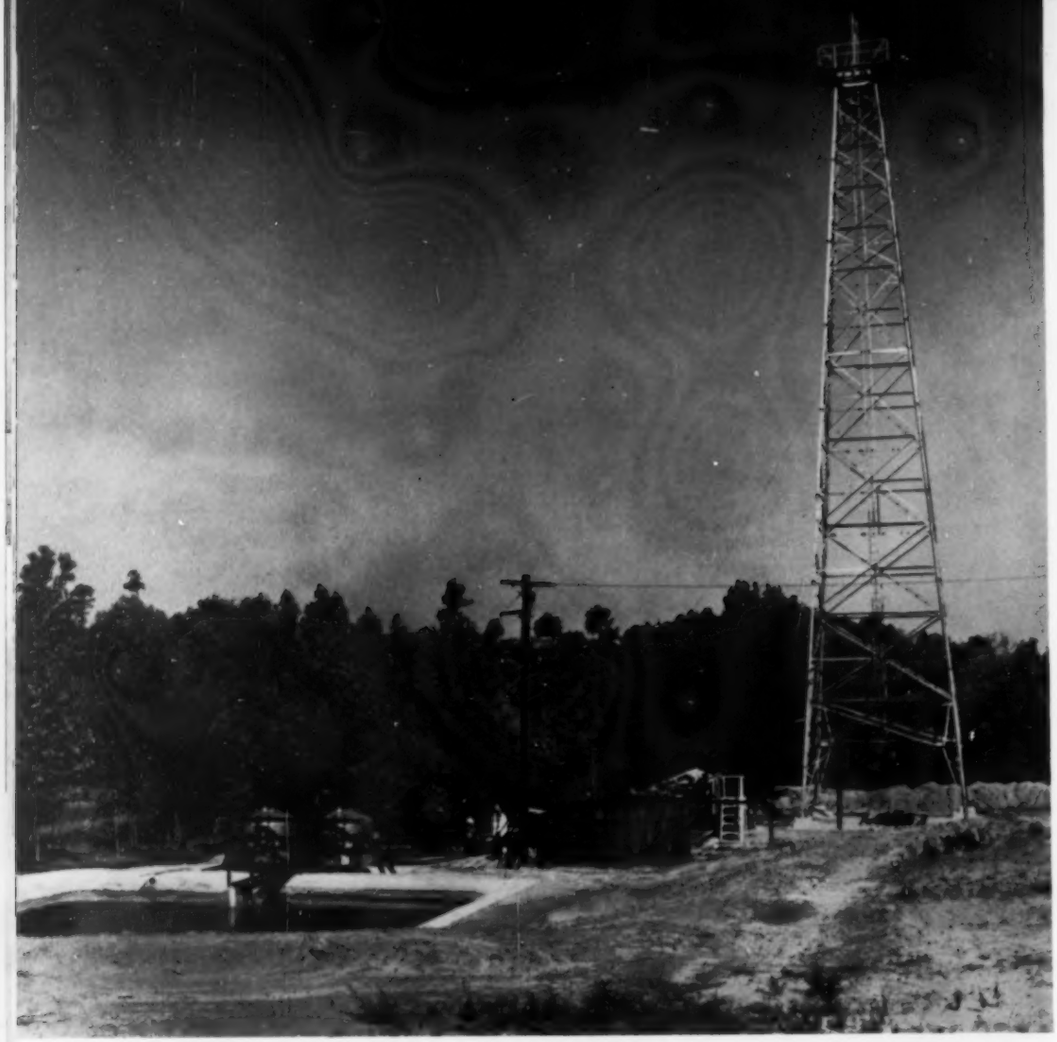
Oil workers of the "Second Baku" are successfully applying new methods of drilling. Thus, in the same Zhiguli oil fields, where the petroleum lies at a great depth under the hills, elevations, involving incredibly difficult work in the former method of drilling from the higher bringing equipment weighing hundreds of tons up the mountain sides, has been abandoned. Oblique drilling is applied at the foot or base of the hill or mountain. This new method has lowered the cost and raised the speed of drilling. Now, a whole fanlike cluster of wells can be drilled from one base.

Crude oils in the Volga-Urals region have a high content of sulphur (from one to three percent). Stabilization treatment to remove the sulphur is necessary, and proper refining is of special importance. Straight refining of Volga-Urals oils yields only eight to ten percent of benzine on the average, with a high content of sulphur. A combination of the cracking process with sulphur treatment yields forty to forty-five percent of benzine from crude oil. Benzine output from the "Second Baku" is expected to surpass that of the original Baku area.

Derricks in the Zhiguli field.

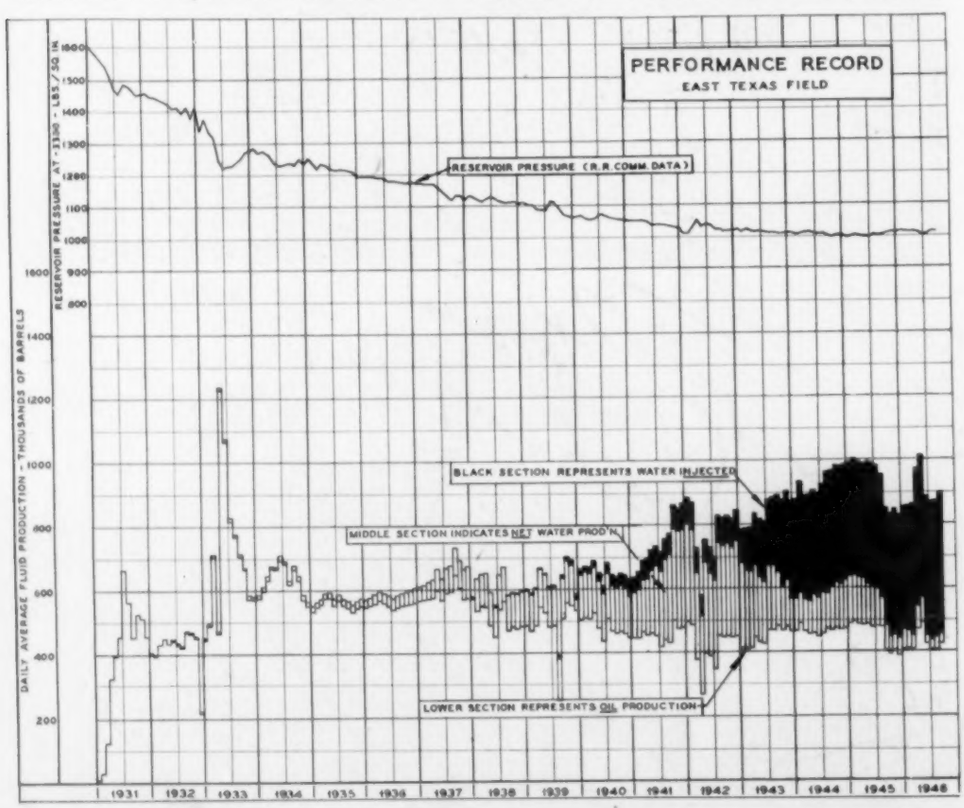
Insulated manifolding at loading terminal on the Volga.

SALT WATER RE



One of the 41 input wells of the East Texas Salt Water Disposal Company.

Record of East Texas production of oil and water, water reinjection and reservoir pressures since discovery of the field.


PERFORMANCE RECORD
EAST TEXAS FIELD
RESERVOIR PRESSURE (R.R. COMM. DATA)
BLACK SECTION REPRESENTS WATER INJECTED
MIDDLE SECTION INDICATES NET WATER PROD'N
LOWER SECTION REPRESENTS OIL PRODUCTION
RESERVOIR PRESSURE AT -3300 - LBS / SQ IN.
DAILY AVERAGE FLUID PRODUCTION - THOUSANDS OF BARRELS
1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946

ULTIMATE oil production of the East Texas field has been increased an estimated 600,000,000 barrels through the return of salt water to the Woodbine sand. The field is a huge stratigraphic trap five miles wide and 42 miles long with a natural water drive from the west.

It is difficult for those who watched the highly competitive over-drilling of the East Texas field fifteen-odd years ago to realize that this astonishing field already has given up 40 percent of its original oil content and that engineers now believe it will produce 80 percent under present producing methods. Cumulative production of the field now stands at two and a half billion barrels, and that much more is expected to be produced commercially.

Five years ago no such rosy picture was in view. At that time the field seemed about ready to enter a period of accelerated decline. Reservoir pressure was down 595 pounds from its original 1620, and extrapolation of the curve suggested that pressure would be down another 225 pounds to about 800 pounds by the end of 1946. What has actually happened is that the decline rate has been halted. As of December 31, 1946, pressure was 1016.2 pounds compared with 1015.71 pounds on Dec. 31, 1942.

Cause of this remarkable change in prospects of the field is as astonishing as the change itself to those who watched the cut-throat producing tactics of the early thirties and the ingenuity of the "hot oil boys" in trying to beat Texas Railroad Commission conservation regulations. The change is a direct result of cooperation between big and little companies and individual producers.

Medium of cooperation in achieving the results indicated above has been the East Texas Salt Water Disposal Company, a $2,000,000 corporation owned by 17 large companies and 234 small organizations and individual producers. Head of the company is one of the small independents, Bryan W. Payne of Iowa Payne Oil Company who serves the Salt Water company without remuneration of any kind and who puts in more time in seeing after the salt water disposal than he does in managing his own business.

East Texas was discovered in 1930 and five years later was producing only 15,000 barrels of salt water daily, but already it was clear that the rate of increase would become algebraic before long. Three years later salt water production in the field was up to 100,000 barrels daily. A year later it had doubled and by 1941 had redoubled to more than 400,000 barrels daily.

PRINT IN BIN

RETURN INCREASES EAST TEXAS OIL RECOVERY

Reservoir pressures were declining rapidly, but that wasn't the worst of it. Fish were disappearing from Texas streams. Farmers were unhappy. The cities of Beaumont and Port Arthur said that their water supply was being made undrinkable. The attorney general filed an injunction suit against further pollution of streams.

Individual operators tried a good many schemes. They tried to use flare gas to evaporate the water. They built huge reservoirs to store up water in dry seasons so that it could be turned into streams at flood stage and not be noticed. A scheme was proposed to lay pipe lines to the Gulf to carry the water to the sea.

While the situation was daily becoming more acute, a group of operators drilled a special test well west of the producing limits of the field and began studying the technique of returning salt water to the reservoir. A corps of chemists and engineers watched the experiment carefully with the result that a number of the larger oil companies decided to build disposal systems.

In July, 1941, a cooperative disposal system was proposed to the Texas Railroad Commission. The commission approved and aided the idea by permitting transfer of oil allowables to other wells on a lease, later by allowing an extra barrel of oil to be produced for every 50 barrels of salt water returned to the sand and still later by permitting transfer of thus bonus oil from one lease to another. Result was to speed development of the idea. On October 1, 1942, the East Texas Salt Water Disposal Company injected its first barrel of salt water into the Woodbine sand.

Today the Salt Water Disposal Company has nearly 200 employees operating more than 226 miles of gathering lines through which 340,000 barrels of salt water is being run to 41 disposal wells from 501 leases. Cumulative salt water injected into the sand by December 31, 1946 was 319,071,341 barrels. In 1946 the total was 110,353,323 barrels out of 174,661,000 produced in the field. Other companies in the field operate 37 input wells serving 1074 wells on 127 leases. These operators returned 45,800,856 barrels of water to the sand in 1946. Only about 5 percent of the total salt water production in the field is not now being pumped back into the sand.

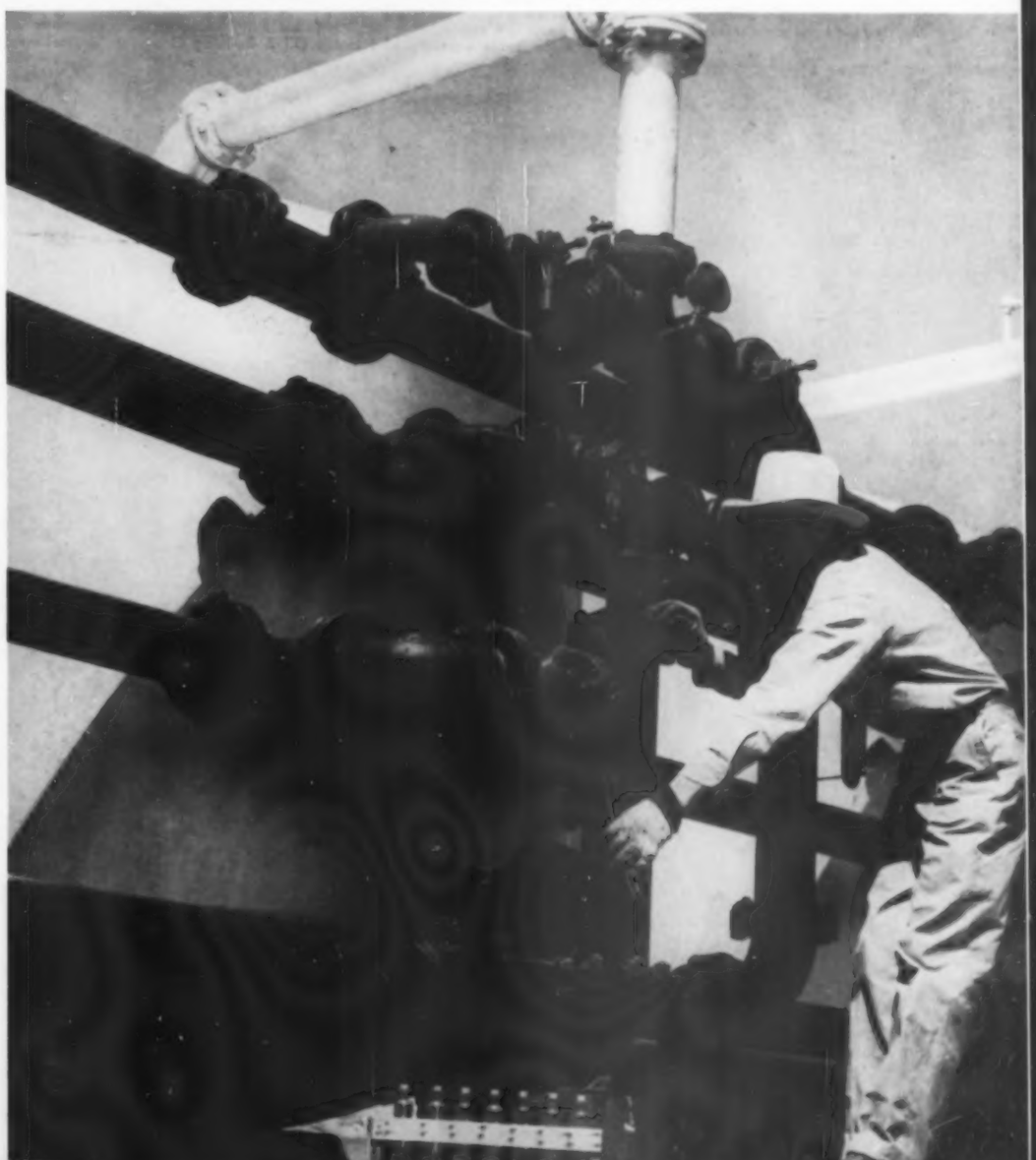
An accompanying chart shows the history of oil and salt water production of the field from discovery through September, 1946. The black area shows the steady growth of salt water reinjection which made possible the flat upper curve representing reservoir pressure. Study of this performance chart suggests that the field can produce perhaps 500,000 net barrels of liquid daily without affecting reservoir pressure and that a net liquid withdrawal below that level actually tends to permit an increase in field pressures. Field pressure increased in both 1945 and 1946.

The East Texas Salt Water Disposal Company handles water for its owners and outsiders alike. All pay the same rate of 1.8 cents per barrel of water. The company lays the gathering lines from lease tankage to disposal wells, installs meters and charges on the basis of meter readings. Since an open system is necessarily used in East Texas, the salt water is highly corrosive. It has been necessary to use asbestos cement lines instead of steel. Asbestos cement underdrain systems have been installed in sand filters and water treating stations when various metals were found unsatisfactory. Liners of alloy steel and brass are used in pumps instead of cast steel. Porcelain plungers are used in one vertical pump and rubber pistons, valves and valve seats have given satisfaction. Corrosion in the input wells is retarded by using cement lined casing as tubing. Meter corrosion seems to be a matter of constant repair and maintenance. The company keeps three crews in the field continuously.

Water is collected for treating at low points in the field so that it may flow by gravity from leases. The water first is skimmed to remove any traces of oil and then aerated to cool it, kill organic growths and oxidize iron salts so that they will drop out readily in the settling tank.

Aerated water is next chlorinated to prevent formation of iron sulfide by bacterial action on sulfates. Chlorinated water is settled in a baffled settling pond, then aerated thoroughly and given a second chlorine treatment. After the second chlorination, the water is mixed with controlled quantities of lime and aluminum sulfate to bring about flocculation. Finally the floc-laden water

Sand filters strip floc from 5,000 barrels of treated water before it is necessary to backwash.



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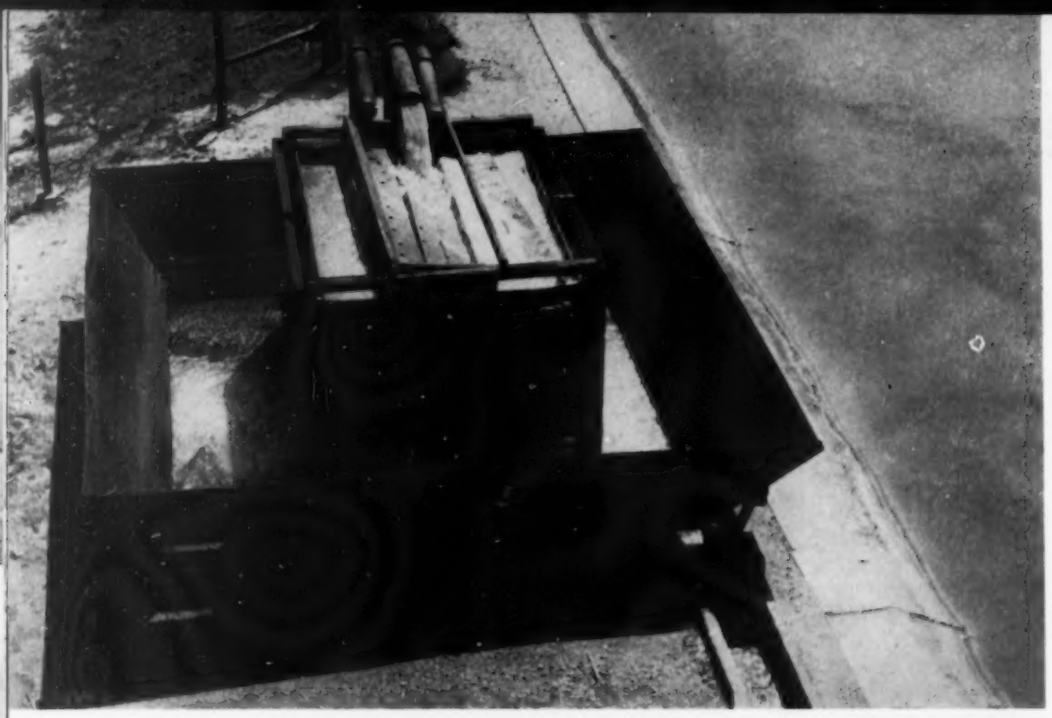


Raw water from leases is aerated and skimmed of oil traces before being run to settling basins.

passes through another system of settling basins, is filtered and pumped or flowed to input wells.

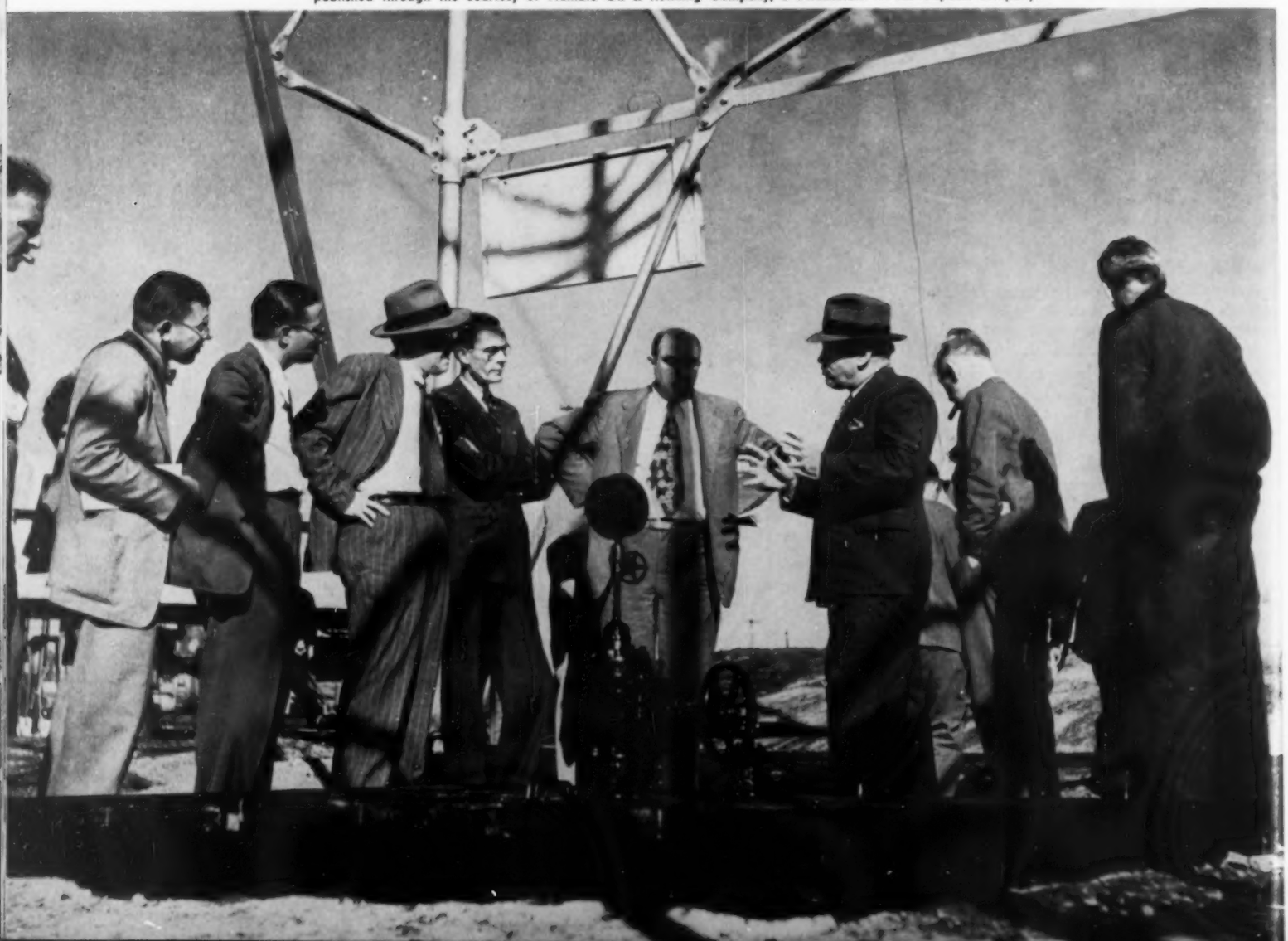
Filters are constructed of ¼-inch steel plate. They are 72 or 90 inches in diameter with dished heads and bottoms. Flow is downward through a sand and gravel bed. All treating plants consist of two or more such filters so arranged that one or more may be cut out for backwashing while the remainder are being operated. Each filter is designed to handle 5,000 barrels of water in 24 hours and must be backwashed daily.

Disposal wells in some instances are abandoned oil wells which have been worked over and retubed for the purpose. In a great many cases, however, it has been considered more economical to drill entirely new wells in order to get the optimum location or for other reasons. Some wells are located west of the productive limits of the field, while others are located in the field itself. In any case, the wells must be completed in such a way that the salt water is injected well below the oil-water contact and below a substantial shale break. West of the field the sand face available for injection is greater.

In completing wells, acidizing is employed to prepare the sand face. Even with the careful water treatment as outlined above, it is necessary to clean out input wells from time to time. Acid is used in this process also. Some wells take astonishingly large quantities of water with little maintenance. Some have taken up to 18,000 barrels daily, and one has taken about 15 million barrels in the past four years.

Initial costs of the East Texas Salt Water Disposal Company system approximated $10 per barrel of daily capacity.

Bryan Payne (at right of well-head assembly) explains operation of an East Texas Salt Water Disposal Company input well to a group of visitors. Photographs with this article are published through the courtesy of Humble Oil & Refining Company, a stockholder in the disposal company.



STATE DEPARTMENT FAVORS MID-EAST DEALS

By WILLIAM J. MADDOX

Chief, World Petroleum's Washington Bureau

WHILE acknowledging its keen interest in Middle East oil developments, the State Department is sticking close to the side-lines in the international stir currently created by the deals between British and American companies in that part of the world. Official attitude toward the French government's protest is understood to be that the dispute is among private companies and not on a government level—as yet. Until the litigation now pending in Britain is concluded, officials indicate they will maintain a hands-off policy.

The French protest, delivered to Undersecretary of State Will Clayton by Ambassador Henri Bonnet, charged that Jersey Standard and Socony-Vacuum by buying into the Arabian-American Oil Company have violated the "Red Line" agreement of 1928, by which the companies participating in the Iraq Petroleum combinations bound themselves not to engage in any independent activities within a specified area of which Saudi Arabia is a part. It is understood no formal reply was made and that the department did not consider the objections raised by the French as a formal protest.

According to statements issued by the two American companies, they were advised by British legal experts before the start of the recent negotiations that the Red Line agreement automatically terminated when the government at Whitehall applied the enemy trading act to France following the German occupation. They say further that they notified their associates in the Iraq group to that effect months ago. The French, on the other hand, maintain that the opinion given them by their lawyers is that the agreement remains in force since it has not been rescinded by action of the member companies. Since Iraq Petroleum is a British corporation, the suit has been filed in a London court, and presumably any diplomatic action will await the finding of the court. It is possible that no such action will be needed. The statement issued by Standard Oil Co. (N. J.) contains the following significant passage: "The American group has advised all participants of a willingness to enter a new agreement concerning the Iraq Petroleum Company, as long as it does not contain any restrictions on free enterprise." According to reports from London, the supplementary document submitted by the French company also indicates willingness to consider some readjustment.

As interpreted here in Washington, the purpose of the suit brought by the Compagnie Francaise des Petroles may be intended more to assert the claim of France to consideration and consultation in matters affecting Middle East oil than to invalidate the deal between four companies that are all American-owned. As stated both by Jersey Standard and Socony, their acquisition of an interest in Arabian oil is aimed at bringing their future crude supply position in the Eastern Hemisphere into balance with the expected growth of market demands. In confirming the agreement in principle, the two companies pointed out that this transaction, as well as the undertaking for purchase of crude from Anglo-Iranian, has been discussed with the United States Department of State and other interested government departments.

Max W. Ball, Director, Oil and Gas Division, Department of Interior.

It has been understood here that the State Department gave the two contemplated deals its blessing—unofficially. Officials let it be known that they welcomed news of the transactions because of the expectation that they would relieve the drain on the reserves of oil in the United States and South America. South American oil, it was pointed out, would be free to flow to this country instead of to European markets.

Although the United States government, of course, has no financial interest in the activities of the American companies, the French official attitude is that this government is nevertheless involved in the deals. They claim the United States intervened in the negotiations leading up to the organization of Iraq Petroleum and insisted that Americans be allowed to share in it. This may be a good diplomatic argument but is held to have no bearing on the legal issue that has been raised.

IN spite of the ban on special committees under the bill by which Congress in the closing days of last year's session tried to reorganize itself and streamline its cumbersome processes, an attempt is to be made to give the Senate special oil investigating committee a new lease on life. The committee was created for the purpose of formulating both a domestic and a foreign oil policy for the United States. Extensive hearings have been held covering many phases of the oil business, but it is felt that further work should be done. As a result Senators Moore of Oklahoma, and Brewster of Maine, have introduced a resolution to continue the committee through the 80th Congress, in other words, for two more years. Expectation is that the committee will receive approval despite the ban on special committees.

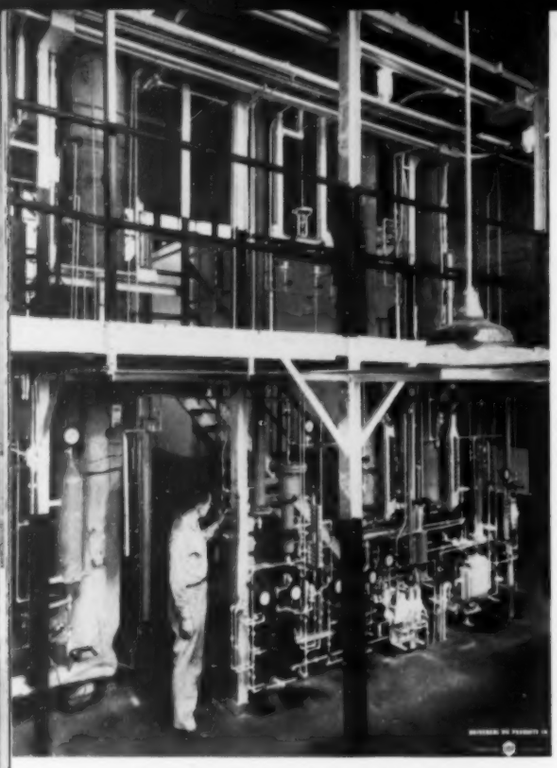
On the House side of the Capitol, the petroleum investigating subcommittee of the Committee on Interstate and Foreign Commerce has come up with a report which, among other things, contains recommendations as to possible means of augmenting the nation's oil supplies. In addition to possibilities in this country, the committee draws attention to South America. It says:

"Discussions might be carried on with the nearby foreign countries, such as Venezuela, Colombia, and Mexico, designed to assure provision of mutual petroleum supply in the event of war which involves or threatens the Western Hemisphere. This might include consideration of ways of building up a greater reserve of productive capacity through exploration for new sources of supply and wider application of conservation practices. With a production of about 1,000,000 barrels daily of oil in February 1946, Venezuela flared some 700,000,000 cubic feet of natural gas daily. Under some circumstances the building of pipe lines, refineries, and other related facilities in foreign countries may become necessary as a means of making their supplies accessible to the United States.

"Between 300,000 and 400,000 barrels daily of petroleum and its products are now being imported," says the committee. "With domestic demand increasing, it is to be expected that imports may gradually increase. In view of the importance of available foreign sources of oil, the committee considers it to be essential that the United States pursue a forward-looking foreign oil policy so that foreign sources of oil may remain open to American trade and on terms not obnoxious to friendly nations."

The committee expresses the thought that it is "not unlikely" that oil finding in the United States may have reached or passed the halfway mark. In any event, says the report, finding the remainder will be more difficult, take longer and be more costly. Already, it points out, we have the trend toward smaller discoveries and higher costs of finding and development.

NEW "CAT" CRACKER DESIGN REDUCES COKE DEPOSITS



New U.O.P. fluid catalytic cracking pilot plant.

A NEW type fluid catalytic cracking plant has been developed by Universal Oil Products Company. Pilot plant operating results indicate that the new design features will substantially reduce the amount of coke which must be burned. Important operating economies are forecast as a result of the reduction in the quantity of coke deposited on the catalyst.

The higher yield of gasoline is mainly accomplished by two features, namely, better utilization of space in reactor and regenerator, and more efficient stripping of adsorbed light fractions from the spent catalyst. Better utilization of space is achieved by the installation of distribution grids of original design in the reactor and regenerator. This design feature minimizes overcracking and particularly the cracking of catalytic gasoline fractions to gas and coke. The improved stripping is accomplished by the use of an external stripper which allows intimate and efficient contact between the stripping medium, which is steam, and the spent catalyst.

In the new U.O.P. design, coke formation is lessened by two major factors:
(1) The more efficient stripping of the spent catalyst which removes gasoline fractions that otherwise would be lost, also removes much of the heavy coke-forming hydrocarbons before the spent catalyst goes to the regenerator.

(2) Countercurrent flow of spent catalyst and hot flue gas in the regenerator permits the use of the top zone of the regenerator dense phase catalyst bed as a "distillation" section. In this section, flue gas at temperatures higher than those prevailing in the stripper, and practically devoid of oxygen, meets the down-coming spent catalyst, serving to distill off much of the heavy hydrocarbons, thus further reducing the formation of coke.

Considerable economy in construction results from reduction in size of reactor and regenerator, which is made possible by more efficient space utilization.

In designing the latest pilot plant, engineers had at hand extensive data which had been obtained through long study of catalyst circulation in glass models and operation of previous fluid catalyst pilot plants, as well as the practical experience gained in the design and operation during the war of more than a dozen commercial fluid catalytic cracking units.

Certain of the features now embodied in the new pilot plant are illustrated in a small, glass working model in which the catalyst is circulated by compressed air. This model has been on display for months in the Universal offices and has attracted considerable interest when shown at several meetings of refiners' associations.

The new pilot plant normally runs 3-4 barrels of fresh feed and recycle per day. Its principal parts are:

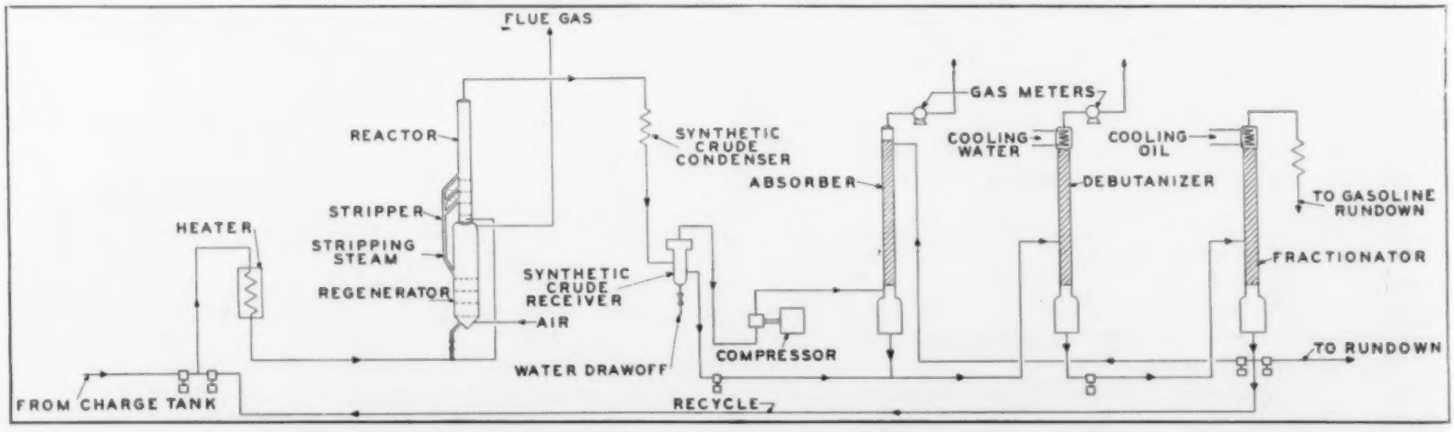
An electrically fired radiant tubular heater, really a miniature U.O.P. Equiflux heater; a reactor-regenerator assembly approximately 23 feet high and 10 inches inside diameter, in which the reactor is at the top of the column and the regenerator is at the bottom; a synthetic crude condenser which cools and condenses the effluent from the reactor; a synthetic crude receiver provided to separate uncondensed gases from the fluid; a compressor which takes uncondensed gases from the receiver and passes them to a high pressure absorber for recovery of butane-butylene fractions which otherwise would be lost.

A debutanizer for removing the dissolved gas from both the synthetic crude and the rich absorption oil. A fractionator which processes the debutanizer bottoms stream for separation of catalytic gasoline from unconverted gas oil. A portion of the gas oil is used as absorption oil in the absorber. The rest is recycled or removed as a net product.

Control instruments required for precise operation of the unit are mounted on an instrument panel which is as complete as that of a large commercial unit.

This new plant has been operated on normal gas oils, and also on heavy gas oils with endpoints up to 1000°F., and has confirmed the increased gasoline yield and reduced coke expected by the design engineers. The accompanying diagram shows the flow through the pilot plant which is being made the basis for projected new commercial units.

Simplified flow diagram of new U.O.P. fluid catalytic cracking pilot plant.



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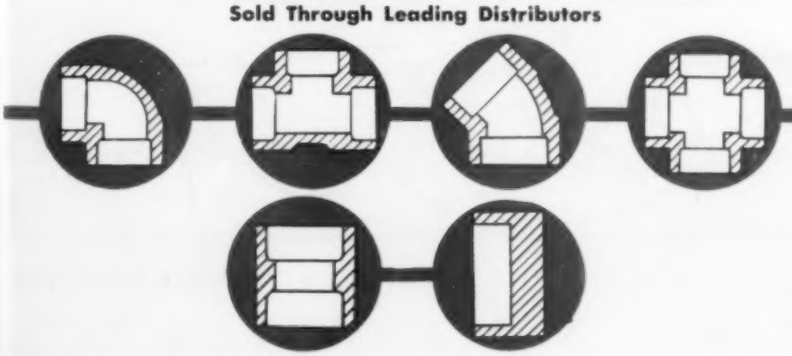


WATSON-STILLMAN
DISTRIBUTOR PRODUCTS DIVISION

International News and Notes

F. G. C. Morris

F. G. C. MORRIS has been appointed managing director of Anglo Iranian Oil Co. He comes to the new post from a former appointment as deputy director in charge of distribution on the continent.

Mr. Morris entered the legal profession as a solicitor after being educated at Rugby. He assisted in the formation of Anglo Iranian's French company in 1920-21 and was named a director of that company. In 1927 he was elected continental deputy director with offices in Paris. These offices were moved to London in 1929.

During the war Mr. Morris was responsible for the distribution department when Sir Hubert Heath Eves became chairman of the tanker tonnage committee of the Petroleum Board. In addition to company duties Mr. Morris undertook many war activities for the government in the Ministry of Fuel and Power and Ministry of War Transport.

C. U. DANIELS, general manager in charge of operations of Pantepec Oil Company of Venezuela, C.A. at Caracas, Venezuela, will become president of the company on April 1, 1947. Mr. Daniels, a former vice-president of Oklahoma Natural Gas Co., will succeed Warren W. Smith, who will retire after 23 years with the company.

O. C. WHEELER has been appointed a vice president of International Petroleum Company and Walter S. Reid was elected a director. Mr. Wheeler was director in charge of exploration before becoming a vice president, and Mr. Reid was until recently executive representative of International Petroleum in Peru.

Mr. Wheeler joined International in 1921 as an assistant field geologist. He was appointed chief geologist in 1937 and was transferred to Imperial Oil, Ltd., as assistant chief geologist in 1942 and appointed chief geologist in 1944. When he became a director of International the following year, he relinquished the Imperial appointment.

Mr. Reid has served continuously in Peru and Venezuela for the past 25 years. For a time he was vice president in charge of public relations for the Standard Oil Company of Venezuela. He was executive representative of International Petroleum in Peru before his election as a director of the company.

Brazilian Production

Statistics supplied by the National Petroleum Council of Brazil give the crude production of that country during 1946 as 66,888 barrels. This output was derived from forty wells in four fields in the State of Bahia. Nearly 80 percent was provided by the Candeias field where several productive wells have been brought in during the past twelve months. Other producing fields were Itaparica, Aratu and Pitanga.

Texas Company's Colombian Discovery

Production tests in Velasquez No. 1 well of Texas Petroleum Company in Colombia, South America, indicate a significant oil discovery. Drilling was started December 8, 1945, and continued into basement rocks at a total depth of 8,455 feet. On a test early in December the well flowed at the rate of 383 barrels per day of 27° API. gravity oil through a quarter inch choke from perforations in the casing opening up four sands in the interval 6,945 to 7,120 feet. The oil was accompanied by 206,000 cubic feet of gas. Velasquez No. 1 is the first test drilled on a large fee property located about 90 miles airline distance from the producing fields of the DeMares Concession.

Flame Over Britain

In "Flame Over Britain," Sir Donald Banks, director general of the British Petroleum Warfare Department, has written an intimate account of how experts in the many phases of petroleum on both sides of the Atlantic pooled their knowledge to help defeat the Axis. This is a book that will appeal to all oil men because nowhere else can one find so complete and understandable a description of the subterranean pipelines and their operation and the chronological history of jellied gasoline.

For the first time, the difference between the British and American approach to this problem is made clear. The British requirement was for a flame-thrower fuel and the American for an incendiary-bomb mixture. The fuels derived from Napalm, a solidifying agent developed by Professor Fieser of Harvard were the backbone of American flame warfare. Besides furnishing the fuel for pack flame-throwers that were used with great success in the island-hopping campaigns of the Pacific, Napalm formed the basis of the redoubtable M-69 bombs developed by Standard of Jersey and used with such effectiveness over Tokyo and other Japanese cities.

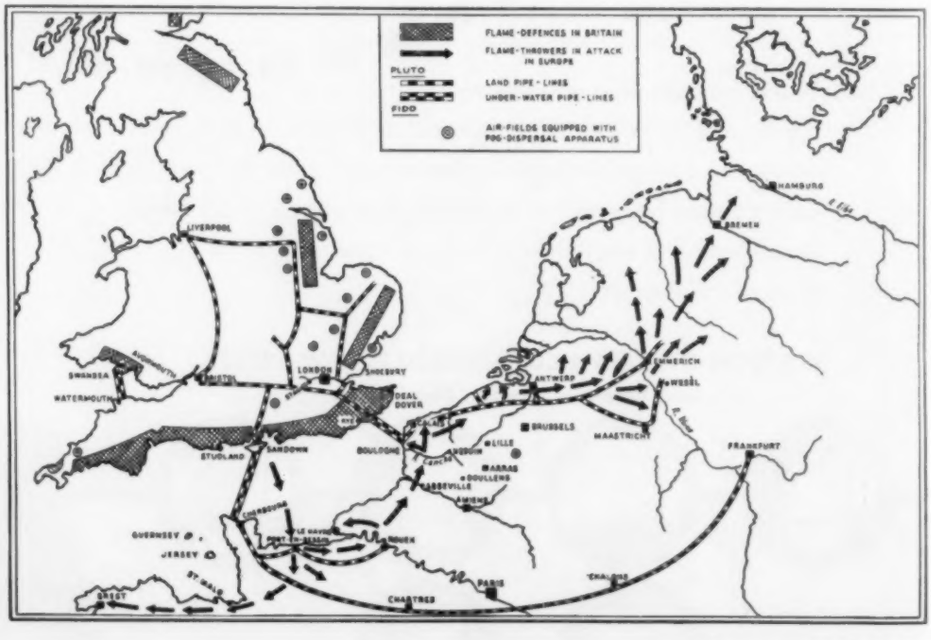
The mechanized flame thrower, brought to its highest stage of development in the British Crocodile—a heavy tank with flame guns and a trailer full of fuel—was use to save innumerable lives. In an operation rivaling the spectacular onslaught of the Germans on the fortress of Eben-Emael early in the war, mechanized flame throwers of the Allies were used to turn the Leopold Canal in Belgium into a sea of flame through which our troops crossed in boats before the surprised enemy had time to collect his thoughts. The attacking force suffered not one casualty.

Included in the book are some 60-odd photographs and drawings showing in great detail the various phases of petroleum warfare. Those on Fido are particularly interesting in that they reveal the initial stages of the successful battle against fog by a system that is now being further improved in this country at the Landing Aids Experimental Station, Arcata, California, of United Airlines.

Such vignettes as the following, describing a chat between Churchill and Eisenhower on the eve of D-Day when the weather threatened to upset the whole plan, add immeasurably to the readability of the book.

It was Sunday, June 4, and Churchill was visiting the Supreme Commander at his headquarters somewhere on the South Coast of England. The weather reports were coming in, and they were anything but encouraging. "It's your decision," said Churchill to Eisenhower, and puffing his cigar and trying to appear unconcerned he moved to another group. But eventually edging nearer again, he could not desist. "Go on, Ike," he said, "I'd do it."

Copies of "Flame Over Britain" are available from New York offices of World Petroleum at $3.60 or from London offices at 18s plus postage.



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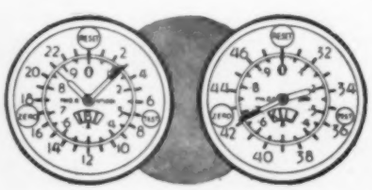

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Dr. Enrique Coloma Silva

Representative in Ecuador

Dr. Enrique Coloma Silva has been appointed representative for the republic of Ecuador for Transamerican Factors, Ltd., according to an announcement by Victor E. Milch, Los Angeles, resident American partner. Dr. Coloma's address is Casilla 251, Quito, Ecuador.

Dr. Coloma recently resigned as technical director for the petroleum industry in the Minister of Economics of Ecuador in order to devote his entire time to Transamerican Factors. He is affiliated with many technical organizations in Latin America.

Colombians Form Consulting Firm

Dr. H. Madero-Paris, formerly chief of the Technical Section of the Ministry of Mines and Petroleum in Colombia, and Dr. Gonzalo Acosta, who served at petroleum engineer in the same department, have established an office in Bogota. They will act as engineering consultants and also as Colombian representatives of oil equipment manufacturers. Both received their engineering education in the United States, Dr. Madero-Paris being a graduate of Oklahoma University and Dr. Acosta having received his training at the University of Texas.

Venezuelan Production

Production of crude oil in Venezuela during the month of November amounted to 33,560,329 barrels, an average of 1,118,677 barrels daily. Exports for the month were 29,521,867 barrels. Production by companies was as follows in barrels of 42 gallons:

Company	West	East	Total
Creole	12,656,897	4,603,606	17,260,503
MeneGrande	1,658,879	3,935,128	5,594,007
Shell	8,962,531		8,962,531
Consolidada		682,088	682,088
Socony		849,909	849,909
Texas		156,312	156,312
B. C. O.	32,690		32,690
All Others	8,310	13,979	22,289
Totals	23,319,307	10,241,022	33,560,329

New Field in India

Reports from India state that Attock Oil Company has brought in a well in what promises to be a productive field near Joya Mair. Oil was found at a depth of 8,200 feet and yielded 350 barrels daily on initial test. The oil is of asphaltic type.

Electrical Code for Oil Industry

The Institute of Petroleum, London, W.1, has issued a 77-page "Electrical Code" which embodies the results of an examination by a committee of engineers, of the practice adopted by the major British oil companies, and of codes of practice, regulations and legal requirements applicable to the industry both in Great Britain and abroad, including in particular various American codes and publications.

Account has been taken, where appropriate, of the codes of practice and standard specifications produced by such British authorities as the Institution of Electrical Engineers, British Standards Institution, Ministry of Fuel and Power, and the Factories Department of the Ministry of Labour and National Service.

The scope of the code is somewhat wider than is usual in codes of this kind, since its field of application embraces conditions and operations throughout the industry from the oil well to the delivery of finished products. (5s.)

Appoints Canadian Representative

Philblack division of Phillips Petroleum Company has appointed H. L. Blanchford, Ltd., of Montreal as its Canadian representative. This firm has serviced the Canadian rubber industry with carbon blacks and other rubber pigments and chemicals since 1921. A Toronto office was established some years ago, and agents are located in Winnipeg, Manitoba and Vancouver, British Columbia.

Hubert Holliday Retires

Hubert Holliday retires on January 1st from the board of the Vacuum Oil Co., Ltd., of which he has been managing director since 1933. He joined the company on July 22nd, 1901, and so completes 45 years of active service. He started as an office boy, was later appointed secretary to the managing director, and in 1912 became secretary to the board. He was appointed a director in 1919.

In September 1939, Mr. Holliday assisted in organizing the Oil Distributors' Emergency Council, better known to the trade as O.D.E.C. This body, which is complementary to the lubricating oil pool, handled all war-time problems affecting the distribution of lubricants, and made a vital contribution to the smooth running of British industry during those difficult years. He has been chairman since its formation of the Garage Trading Committee which is a subcommittee of the O.D.E.C.

At a recent dinner, H. W. Rocke who succeeds Mr. Holliday as managing director, presented him with a wrist watch on behalf of Vacuum executives.

Oil Men Visit Colombia

A number of oil men from various parts of the world have been recent visitors to Colombia. Robert Siegel, special representative of Socony-Vacuum Oil Co. whose headquarters are at Caracas, and Winthrop Rockefeller of the company's industrial relations department in New York have been inspecting Socony's field operations. Mr. Rockefeller's brother, Nelson, a director of Creole Petroleum, met him at Barranquilla during a stop-over en route to Balboa. Roy W. Merritt, special representative of Socony-Vacuum has returned to Bogota after an extended sojourn in Lima, Peru. E. A. Higgins, Shell executive from London and New York, is spending several months surveying Colombian oil operations. Harold J. Wilkinson, chief accountant of Unidas, Sinclair Colombian enterprise, is taking up residence in Bogota.

R. GILLESPIE, general manager of the British Tanker Company since 1944, has been elected a director. Mr. Gillespie joined the tanker company's staff in 1922. He first served in the marine department, then in ship management and subsequently as personnel assistant and chief management assistant to the general manager. During the war he served for a considerable period as assistant director of the tanker division of the Ministry of War Transport. He was recalled to the company from this post in 1944 to succeed the late J. R. Robertson as general manager.

Buys Canadian Company

Trinidad Leaseholds Limited, of London, England, has acquired the capital stock of Good Rich Refining Co., Limited, with refinery at Port Credit, (Toronto). The purchase is a step in the expansion of the activities of Trinidad Leaseholds into Canada to obtain an outlet for its products. Complementary facilities of the Toronto and Trinidad refineries will be integrated.

Trinidad Leaseholds is associated with the Central Mining and Investment Corporation Limited, one of the leading finance corporations in England, with extensive interests in South Africa. This corporation also has substantial petroleum interests in Venezuela. It is a one hundred percent British company and its operations include the production and refining of petroleum and the distribution of petroleum products. The company's fields and refineries are situated in Trinidad, B.W.I., and products are distributed throughout the United Kingdom, Jamaica, Porto Rico, San Domingo, Trinidad and other islands in the Caribbean area.

It is the intention of the company to build up a strong executive staff of Canadians to manage the refinery and distribution operations in Canada. The headquarters of the company will be in Toronto, and the technical and other resources of Trinidad Leaseholds Limited will be available to the Canadian organization. Reuben Rosefield will continue to direct marketing operations. President of the company will be C. G. Johnstone and the vice president Mr. Rosefield. They will also be joint managing directors.

It is the intention to acquire crude oil both in the United States and through the resources of the Trinidad Leaseholds organization. Products manufactured in the Trinidad refinery will be available for distribution in Canada, as the natural outlet for Trinidad products lies geographically in the Americas.

Nomads Elect Officers

At the January meeting of the New York chapter of Nomads, officers for the coming year were elected as follows: A. V. Simonson, president; E. M.Gretzler, National Supply Co., vice president; Norris L. Boulden Jr., International General Electric Co., secretary; George P. Kenny, Thomas C. Wilson, Inc., assistant secretary; Park B. Turner, Jones & Laughlin Steel Co., treasurer; Joseph B. Roberts, Jr., Chain Belt Co., assistant treasurer; M. J. Livingston, Arthur G. McKee & Co., sergeant-at-arms; James G. Burnett, Heat Transfer Products, Inc., assistant sergeant-at-arms; Val R. Wittich and James W. Reed, regents.

Colombia Establishes Petroleum Council

Prior to its adjournment in December, the Colombian Congress established a National Petroleum Council to act in an advisory capacity in matters affecting the national interests in petroleum. The Council will consist of five members, each of whom is to be a specialist in some branch of industry operation. One of the first undertakings of the Council is expected to be a study that will serve as a basis for recommendations of a new oil bill to be acted upon by Congress at its next session which begins in July, 1947.

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REPRESENTATIVES IN PRINCIPAL CITIES OF THE WORLD

OIL SEARCH IN PALESTINE

By Ernst Aschner

Drilling for oil in southern Palestine now being carried out after a decade of preliminary work which was interrupted through the war, is expected to prove whether oil exists in commercial quantities under the surface of the Holy Land. The answer to this question, impatiently awaited by oil interests and politicians alike, may have a considerable bearing on the future of that country since oil is one of the major factors in the shaping of Middle East policy. Coincidentally or otherwise two negative decisions and one positive were taken by various parties concerned pending the outcome of the bores. The two negative ones were the adjournment of the London talks on Palestine and the holding up of a decision on the Arabian-American pipeline, while the positive one was the foundation of new Jewish settlements in the Negev.

The Negev is one of the three regions in southern Palestine where geological and geophysical surveys have indicated the probable presence of oil. The other two regions are in the Gaza sub-district and in the area around Jebel Uzdum (Mount Sodom) at the southern end of the Dead Sea.

A total of 31 oil prospecting licenses in these areas have been granted by the Palestine government to the Petroleum Development (Palestine) Ltd. and the Jordan Exploration Company, Ltd. The laws governing the exploitation of Palestine's oil resources, as summarized in the Palestine Government report to the Anglo-American inquiry Commission, contain time-limit clauses in the interests of genuine and expeditions development, affecting the commencement of the work and the expiry of the concession. At the end of the concession, all rights revert to the government and all leases of state domain lands specify the right of the government to resume possession of the area for public utility purposes.

In 1938 a special ordinance governing the prospecting for and mining of oil was enacted. The director of the Public Works Department administers this ordinance as Controller of Oil Mines. The ordinance prohibits prospecting for or mining of oil, except under an oil prospecting license or an oil mining lease. Provision is also made for the right of pre-emption of oil by the government, in the event of grave emergency.

Both the Petroleum Development (Palestine) Ltd. and the Jordon Exploration Society had completed their preliminary surveys of the coastal and Dead Sea regions when the war broke out in 1939. Owing to shortage of materials and manpower and the uncertain military situation in the Middle Eeast, no further development took place during the war years. Activity was resumed, however, immediately following the cessation of hostilities, when the Petroleum Development Co. ordered the required equipment, which has arrived in Palestine from England and America during last summer.

According to Dr. Julius Fohs, 23 domes of more or less promise, covering more than 1,000 square miles were mapped in western Palestine. Of these about 300 square miles are considered promising for oil and gas, including 100 square miles which are particularly promising.

The sinking of the first well is now being undertaken in the Gaza district by the Petroleum Development Company, which holds the concessions in the coastal area and in the Negev. The company is jointly owned by the constituents of the Iraq Petroleum Company including Anglo-Iranian, Shell, Near East Development Company (Socony Vacuum and Standard Oil Co. (N. J.)) and the Compagnie Francaise de Petrole, each holding 23¾ percent of the shares, with the remaining five percent held by Participations and Investments Ltd. owned by the Armenian Oil magnate C. S. Gulbenkian.

Exploratory drilling began this year, while the first deep bore will now test the resources of the Gaza sub-district. How this will affect the balance of Middle East oil reserves remains to be seen, though it is expected that no radical change of the present setup will take place, as Palestine is believed to hold a minor place among the world's potential oil producers. Oil production in the Middle East is at present only about six percent of the world's output, but the area has almost one third of the world's proven resources.

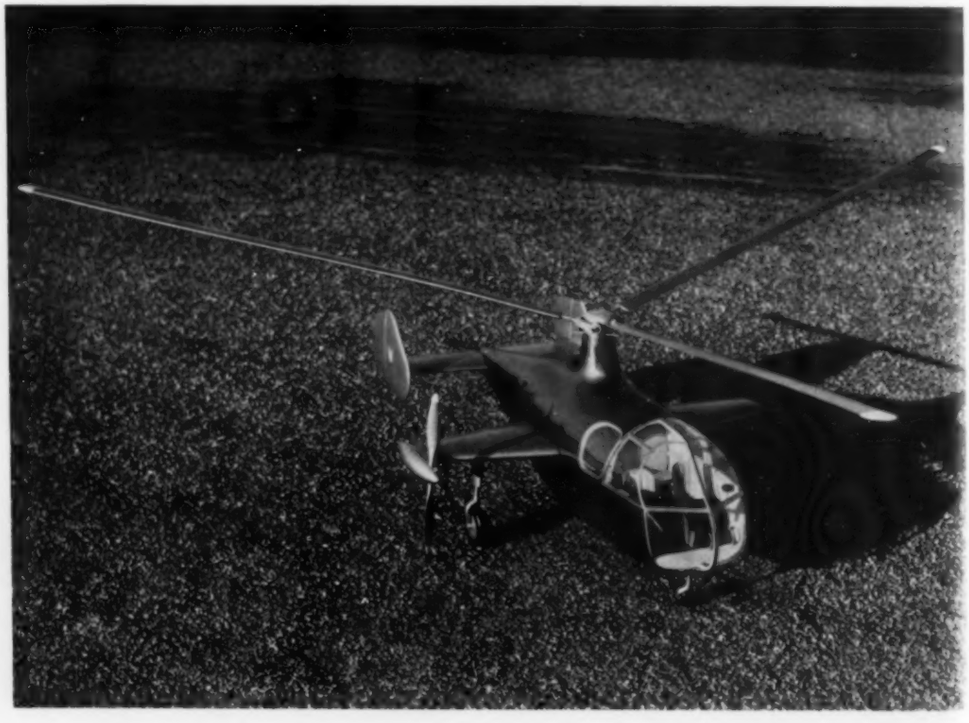
While no sensational strikes are expected from the present tests, the amount of work and materials so far invested in the exploration of Palestine's resources and the technical data gained in the preliminary surveys suggest that there are good prospects for the developments of oil supplies in that area.

Sir Bilsland Joins Burmah Board

The Burmah Oil Company, Ltd., announces that G. C. Whigham, who has been actively associated with the company both in the East and in the U.K. for some forty-two years and who retired from active employment a year ago, has resigned from its board and from those of its 100% subsidiaries. An invitation from these companies to Sir (A) Steven Bilsland, Bart., M.C., J.P., to a seat on their boards has been accepted.

New Type Helicopter

A new type helicopter which is propelled in forward flight by an orthodox propeller has been developed by The Fairey Aviation Company, Ltd., Hayes, Middlesex, England. The new plane is known as a Gyrodyne. Showing of the first model was at the recent Paris areo show. Military and civil versions of the plane are planned. Fairey also manufactures a two-seat monoplane known as the "Tipsy Belfair" with a range of 1250 miles which can take off in 85 yards and land in 65 yards. At 100 miles per hour fuel consumption is 35 miles per gallon.



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OIL COMPANY STAFF CHANGES

Sidney A. Swensrud

SIDNEY A. SWENSRUD has been appointed executive vice president of The Standard Oil Company (Ohio), a new office, and Earl D. Wallace and Samuel H. Elliott have been made vice presidents. The announcement follows the division of the company's production, supply and transportation department into three separate main departments.

The production department will be under the management and direction of Mr. Wallace; the transportation department, under Mr. Elliott; and the supply and distribution department, under Richard C. Sauer. Mr. Swensrud will have general charge of these three new departments as well as of the manufacturing department.

Mr. Swensrud joined Sohio as assistant to the president in 1928 and has been a vice president since August, 1939, in charge of production, transportation and supply.

Mr. Wallace joined Sohio in October, 1942, as land and production manager in the crude oil production division of the production, supply and transportation department. Prior to that he had been active in Petroleum Exploration Company and The Wiser Oil Company at Lexington, Ky.

Mr. Elliott joined Sohio in 1929. In 1934 he was named purchasing agent and in 1938 became assistant to Mr. Swensrud when the company began its active expansion of pipe lines. In 1943 he was named manager of transportation operations for the company, which operates more than 3,000 miles of gasoline and crude oil pipe lines and one of the largest fleets of petroleum carriers on the Mississippi-Ohio Rivers waterways. He is a vice president of Sohio Pipe Line Company.

Mr. Sauer is a vice president of Sohio Petroleum Company. He started with Sohio as an office boy before he was 17 and has served largely in the traffic and refined products distribution departments. He spent two and a half years in Washington during the war as assistant director of supply of the Petroleum Administration for War.

Alfred E. Wolf has been appointed administrative assistant to the new executive vice president.

D. B. Hodges

D. B. HODGES has been named vice president of transportation and supplies for the Shell Oil Co., Inc. He has been with Shell for more than twenty years. He began his career with Shell immediately after leaving the University of Nebraska and became administrative assistant in manufacturing in San Francisco ten years later, and executive assistant to the vice president in 1939. The following year he came to New York as manager of shipping and supplies. In January, 1946, he was promoted to general manager of the transportation and supplies department. During the war Mr. Hodges served as associate director of the supply and transportation division of the Petroleum Administration for War.

JOHN GLENN (Jack) PEW has been elected vice president in charge of production of Sun Oil Company to succeed his father, the late J. Edgar Pew who died last November. He also was elected president of the Sun Pipe Line Company (Texas), a subsidiary of Sun Oil Company.

Jack Pew has been associated with oil field operations in Texas, Oklahoma and Louisiana for almost 25 years. He has been a director of Sun Oil Company and assistant to the vice president in charge of production since 1941.

Mr. Pew was born in Beaumont, Texas, May 14, 1902. He attended Southern Methodist University, Cornell University and Massachusetts Institute of Technology. During summer vacations he worked in Texas oil fields and after college entered Sun Oil Company's production department as warehouseman and timekeeper at Wortham, Texas. He held a variety of positions in the land and production departments in the years that followed. His home is in Dallas.

John Glenn Pew

FRANCIS S. McILHENNY, JR., newly-elected secretary-treasurer and director of Sun Oil Company, succeeds Frank Cross who died November 25, 1945, after serving in that capacity more than 40 years. Mr. McIlhenny becomes the second person to hold the position of secretary in Sun Oil Company.

Mr. McIlhenny, who is 36, joined the treasury department of Sun in 1939. During the war he served as a Naval officer for more than two years, part of the time as a lieutenant on the staff of Rear Admiral Milo F. Draemel, commandant of the Philadelphia Navy Yard and the Fourth Naval District. Upon returning to Sun Oil Company in 1944 he was named assistant secretary and assistant treasurer.

E. F. BATTSON has been elected president of Continental Steamship Company, Baltimore, a subsidiary of Continental Oil Company. The company operates a fleet of tankers between the Gulf Coast and the Atlantic seaboard, with terminals at Lake Charles, Baltimore, Richmond and Norfolk.

Battson, who is assistant to President Dan Moran, Continental Oil Company, will handle the steamship company assignment in addition to his other duties. He has been associated with Continental for 25 years.

WILLIAM M. STRATFORD has been elected president of Texaco Development Corporation. He succeeds R. J. Dearborn who has retired after 27 years with The Texas Company and the development corporation. William P. Gee and Charles F. Teichmann have been elected vice presidents.

Mr. Stratford was employed by The Texas Company in 1919 as a chemist in the company's research laboratory at Port Arthur, Texas. He was later transferred to the New York offices as patent attorney and in 1933 was elected vice president and a director of Texaco Development Corporation. Mr. Gee and Mr. Teichmann also started with Texaco as chemists at Port Arthur and later were transferred to the development corporation.

Wm. M. Stratford

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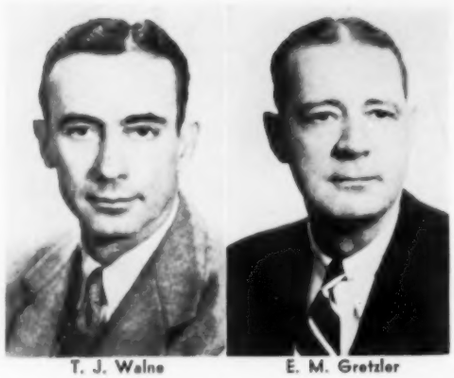

T. J. Walne E. M. Gretzler

National Supply Expands Export Branch

To deal with the rapidly growing demand for oil industry equipment from markets outside the United States, the National Supply Company has enlarged the scope of its subsidiary National Export Corporation with headquarters in New York. Thomas J. Walne, who has been division engineer of the corporation has been elected vice president and general manager, and E. M. Gretzler has been made vice president in charge of export sales. L. V. Boggs, who formerly directed export activities, has retired after 26 years' service but will continue to act in an advisory capacity.

In announcing the appointments A. E. Walker, president of National Supply Company, said:

"Since the termination of the war, activities in foreign fields have increased tremendously, and foreign nations have not as yet reestablished their manufacturing facilities to a point where they can meet a substantial part of the requirements. American drilling and pumping equipment is in tremendous demand. Mr. Boggs' services will be missed at this time, but the promotion of Mr. Walne and Mr. Gretzler is only a step in the expansion of our export department."

Mr. Walne, the new general manager of the corporation, studied engineering at Baylor University and the University of Oklahoma. He has been in the oil industry since 1923 and for several years was head of the oil field machinery division of an engineering firm in Port-of-Spain, Trinidad. For two years after joining National Supply in 1943 he was located in the Toledo offices of the company and last year became division engineer of the export corporation. Mr. Gretzler, vice president in charge of export sales, joined the National Supply Company in 1919 upon his graduation from Carnegie Institute of Technology. In 1927 he became manager of the company's branch in the Ploesti oil field in Romania, returning to New York in 1937 to become manager of export sales.

GEORGE D. McDANIEL has been appointed manager of the eastern marketing region by Socony-Vacuum Oil Company, Inc. The region includes all Atlantic Coast states from Maine through South Carolina and also the District of Columbia and West Virginia. Mr. McDaniel succeeds John M. Martin who has been employed by Socony-Vacuum since 1904 and who now becomes an advisor on domestic marketing. Mr. McDaniel has been manager of the southeastern division. Succeeding Mr. McDaniel in Baltimore will be A. W. Warner, district manager in Kansas City, Mo., for the last four years.

H. E. BRANDLI has been appointed vice president and general manager of Cities Service Oil Company (Pa.). Previously he was vice president in charge of export and wholesale sales.

Mr. Brandli joined the Cities Service organization in 1912. Since 1921 he has been in charge of the Cities Service Export Oil Company in New York. He is also director of Petroleum Advisers, Inc., and vice president and director of Oil Trades Association.

JOE C. KAHL, northwest division chief scout for The Carter Oil Company at Billings, Montana, has been named chief scout for Carter, with headquarters in Tulsa. At the same time, appointments of Harry C. Chapman, Carter attorney at Billings, as assistant manager of the northwest division; John O. Campbell Jr., Tulsa, formerly chief scout, as assistant to the manager of the northwest division and A. I. Deaton, legal department, Tulsa, to the Carter legal staff in Billings, were revealed.

WILEY BUTLER, formerly vice president, has been elected president of the Coastal Oil Company, Newark, N. J. Louis E. Marron, formerly president, has become chairman of the board.

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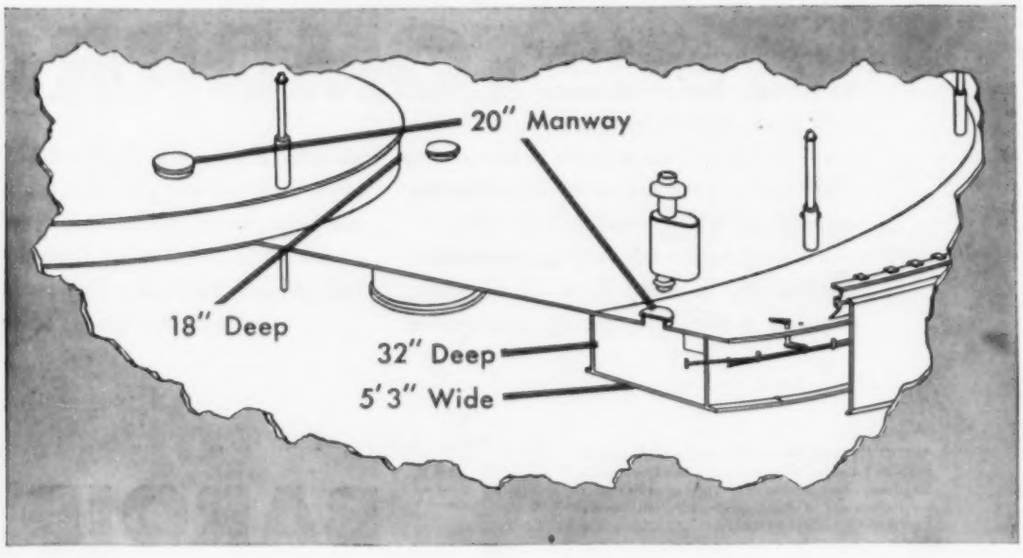

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Standard-Vacuum Oil Company

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WALTER L. FAUST, a vice president and director of the Socony-Vacuum Oil Company, Inc., has been placed in charge of all the compnay's foreign marketing operations. He will also be chairman of the foreign trade committee.

Mr. Faust has been in charge of the company's domestic marketing and will be succeeded in that capacity by A. L. Nickerson, who recently returned to the States after having been chairman of the board of the Vacuum Oil Company, Ltd., London. Before he went to England, Mr. Nickerson was assistant general manager of the eastern marketing region. He started to work for Socony-Vacuum as a service station salesman in 1913 and was elected a director last fall.

In assuming his new duties, Mr. Faust will be returning to the field in which he operated in his early years with the company. When he joined the Vacuum Oil Company in 1929, Mr. Faust became the domestic sales manager of the Marine Sales Department. Two years later, on the merger of Vacuum and Socony, he was appointed general manager of the company's world-wide marine sales and later assumed direction of domestic and foreign aviation marketing activities.

R. E. BAKER has resigned as secretary and treasurer of Arthur G. McKee & Company after 40 years of continuous service with the company and its predecessors. He has been a director, secretary and treasurer of the company since its incorporation in 1915 and previously was a partner of Arthur G. McKee. He joined Mr. McKee soon after the latter opened an engineering office in Cleveland in 1905.

The directors elected two officers to fill the vacancies created by Mr. Baker's resignation. H. R. Moorhouse was elected secretary and James Krumhansl was elected treasurer. Mr. Moorhouse has been Mr. Baker's assistant since 1929 and in recent years has been assistant secretary. Mr. Krumhansl has been with the company since 1913 and for many years has been assistant treasurer.

DR. JOHN W. FREY has been made director of the American Petroleum Institute's division of marketing. The appointment becomes effective February 1, 1947. Starting with his selection as advisor to the deputy administrator of the NRA on petroleum marketing in 1933, Dr. Frey has since been identified with marketing problems of the industry, and is the author of about 50 reports, articles, speeches, and papers on this subject. The division offices temporarily will be located in the Washington office of the Institute.

Dr. WILLIAM J. SPARKS, who has been actively associated with the development of a synthetic rubber that is used extensively for inner tubes in military and civilian vehicles, has been named director of the chemical division of the Esso Laboratories, Standard Oil Development Company, of Linden, N. J. He replaces Dr. Per K. Frolich, who has resigned from the company to enter other activities after 11 years as director of chemical research for the central research and technical organization of Standard Oil Company (New Jersey). With Robert M. Thomas, now associated with the company's Baton Rouge laboratories, Dr. Sparks developed butyl rubber shortly before the war.

Lane Wells Promotes Higgs

Morton T. Higgs, formerly Gulf Coast division manager of Lane-Wells Company for the past eight years, has been appointed to the newly created position of manager of field operations and will make his headquarters in Los Angeles. Field activities of the three Lane-Wells divisions and forty field branches in principal oil areas will be more closely coordinated under Mr. Higgs.

John J. Neale, formerly Gulf Coast division sales manager, has been advanced to the post of division manager. C. F. Ludwig, formerly assistant division operating superintendent, succeeds Neale as division sales manager, and in turn is succeeded by H. W. Hillebrandt of Shreveport.

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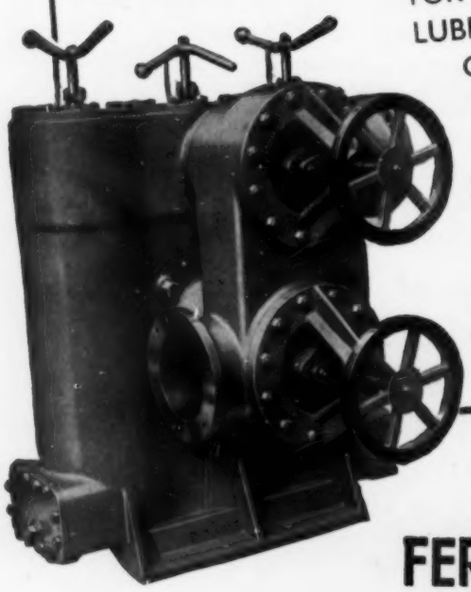

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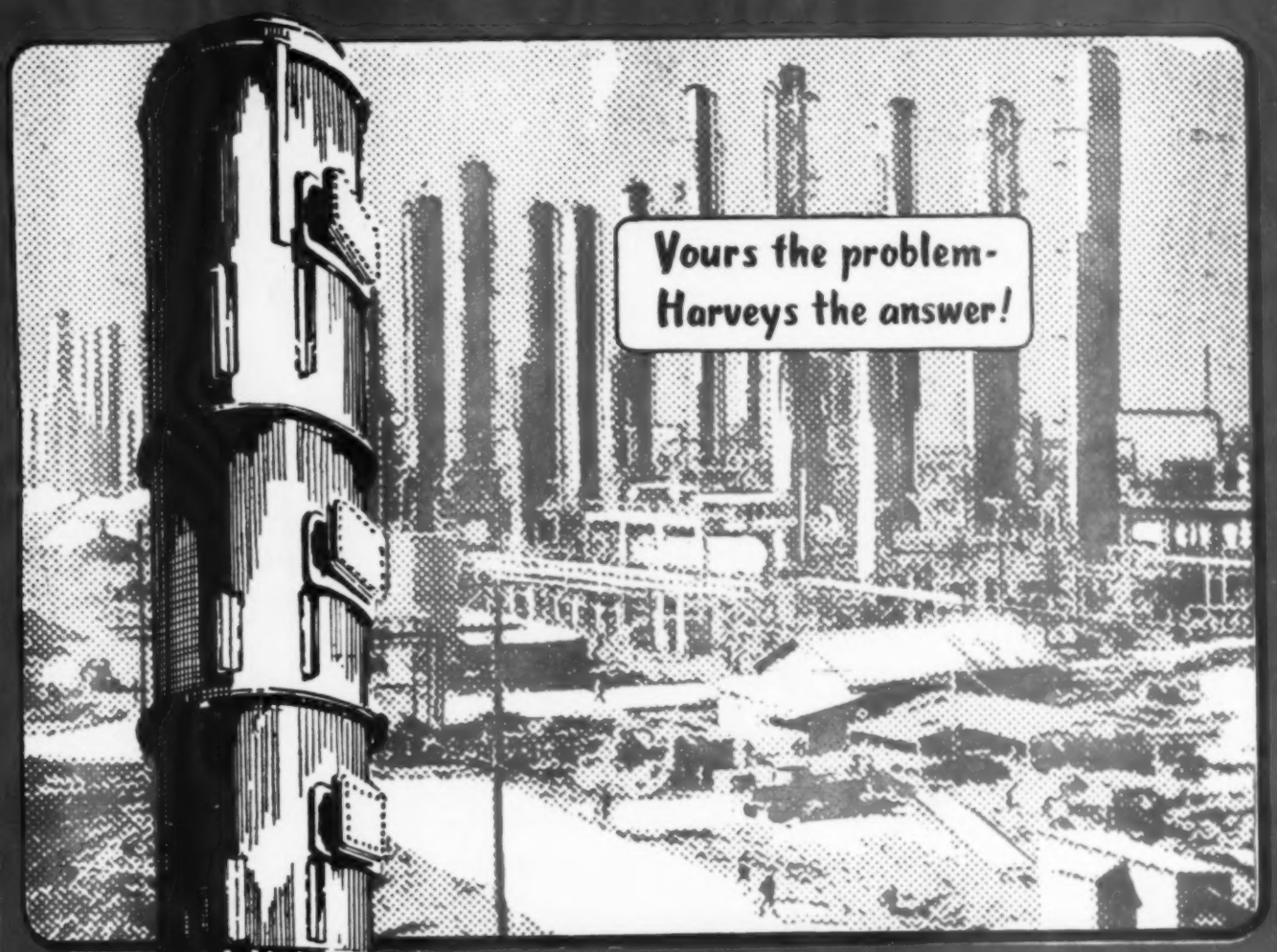

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H. W. Fisher

New Petroleum Chemical Company

H. W. Fisher has been elected president of Enjay Company, Inc., a new company formed to take over the sale and distribution of all products handled by Stanco Distributors, Inc., and Standard Alcohol Company. The new company is a subsidiary of Standard Oil Company (New Jersey). It will handle the national and export marketing of numerous products based on synthetic chemicals derived from petroleum, as distinguished from regular petroleum products such as gasoline and lubricating oil.

Officials of the new company, in addition to Mr. Fisher, are John A. Britton, Jr., and James G. Park, vice presidents; W. F. Quick, secretary; H. P. Schoeck, treasurer; G. M. Buckingham, assistant secretary; and L. R. Moore, assistant treasurer. Mr. Park will be general sales manager of alcohols and related products with W. V. Rathbone as assistant. Synthetic rubbers are managed by Mr. Britton with I. E. Lightbown as assistant. Lubricant additives, called Paramins, are also under Mr. Britton's supervision with A. Bruce Boehm as assistant manager.

B. E. PARSONS, vice president and director of production of General Petroleum Corporation, retired January 1, and Max S. App, who has been manager of the production department, succeeded him. Mr. App has been with the company in various production posts since 1912.

"Ben" Parsons came to General Petroleum in 1914 as a geologist. In 1918 he became superintendent of the company's operations at Taft, and since then has worked on through the department up to the position from which he has just retired.

LAURENS H. FRITZ, formerly with Aitkin-Kynett Company, has been appointed industrial advertising manager of Sun Oil Company. He will take charge of advertising, sales promotion and marketing research for industrial products and Sun's wholesale and furnace oil departments. He succeeds John C. Fairchild who has resigned.

R. M. DINGES, vice president of The Continental Supply Company in charge of the New York office and foreign operations, died December 31 in New York City. He joined the Continental organization 24 years ago as a floor man at Virgil, Kansas. In

R. M. Dinges

1927 he was transferred to the Company's foreign division and, at various times, was a representative in Venezuela, Romania and London, England. His service with Continental was uninterrupted except for a period during the war when he was on leave of absence as an executive with the Petroleum Administration for War.

DR. L. A. MIKESKA has been appointed senior research associate of Standard Oil Development Co. Dr. Mikeska is widely known for his work on the structure of hydrocarbons.

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Coordination In Industrial Research

How to organize a working industrial research department is the subject of a new handbook just published by the Standard Oil Company of California under the title, "The Coordination of Motive, Men and Money in Industrial Research."

Reflecting the interest of modern business and industry in the use of science to develop new products, the handbook is based on the experience of a number of large corporations and technological institutes.

The study originally was undertaken to analyze the organization and management of Standard of California's own subsidiary, the California Research Corporation, in comparison with other leading industrial research institutions. It later broadened to examine all phases of organization and business management practices in industrial research. The resulting handbook is being made available to management, interested business, educators and to those interested in organization and research generally.

Topics covered include the origins of science, technical research and laboratories; industrial research motives; general organization and coordination; management guides for executives and key staff personnel, and the provision of funds and their control.

Extensive charts illustrate divisions of responsibility, executive functions, relationships and limits of authority. The report was prepared by Darrell H. Voorhies, organization counsel in Standard's Department on Organization, with the assistance of his associates and A. L. Lyman, vice president and director of laboratories.

Committee On Public Relations

In accordance with action of the board of directors of the American Petroleum Institute at its annual meeting in November, President William R. Boyd, Jr., has appointed a nationwide committee to direct the public relations program of the Institute. Chairman of the committee is John M. Lovejoy, president of Seaboard Oil Company. Others members are:

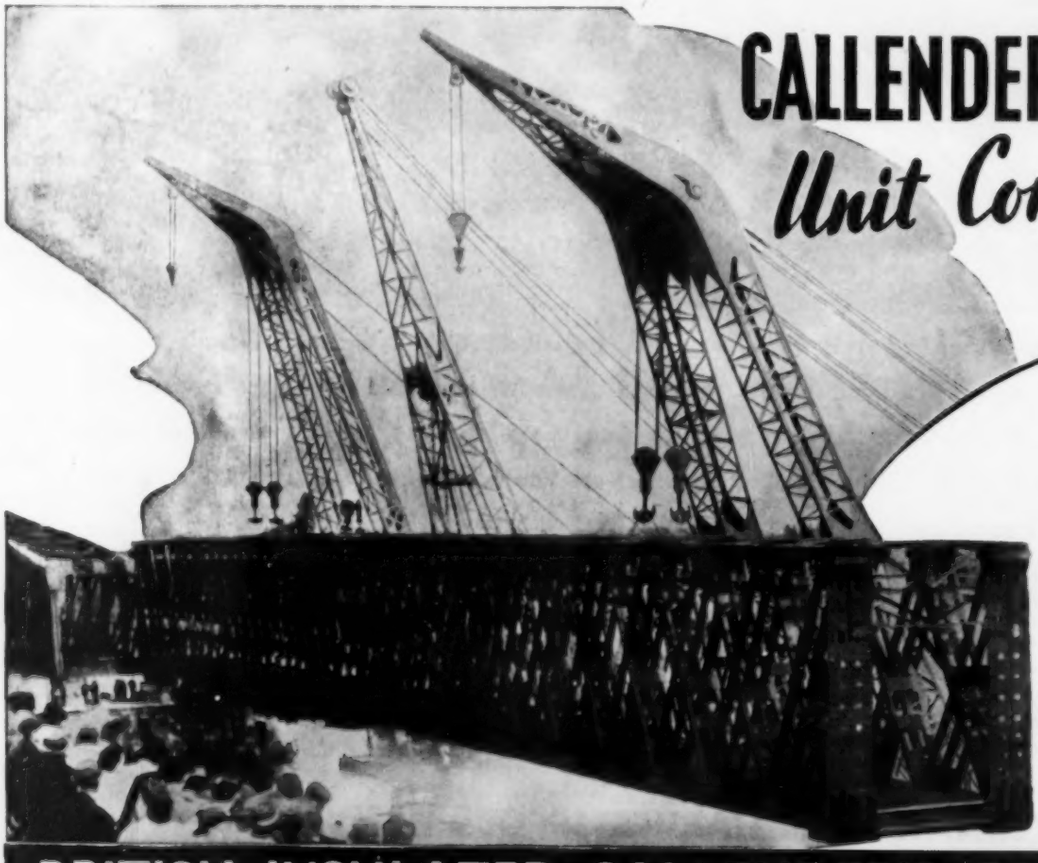
East: R. H. Colley, Atlantic Refining Company; J. Frank Drake, Gulf Oil Corporation; Eugene Holman, Standard Oil Company (N. J.); Alexander Fraser, Shell Oil Co., Inc.; W. S. Hallanan, Plymouth Oil Company; B. Brewster Jennings, Socony Vacuum Oil Co.; W. A. Jones, Cities Service Company; H. A. Logan, United Refining Company; J. Howard Pew, Sun Oil Company; W. S. S. Rodgers, The Texas Company; Earle W. Webb, Ethyl Corporation; Ralph T. Zook, Sloan & Zook.

Mid-Continent: K. S. Adams, Phillips Petroleum Company; T. H. Barton, Lion Oil Company, C. L. Henderson, Vickers Petroleum Co.; B. L. Majewski, Deep Rock Oil Corporation; W. G. Skelly, Skelly Oil Company; W. K. Warren, Warren Petroleum Corp.; L. S. Wescoat, The Pure Oil Company; R. E. Wilson, Standard Oil Co. (Indiana).

Texas: J. L. Hamon, Cox & Hamon; B. A. Hardey, Independent Petroleum Association of America; Geo. A. Hill, Jr., Houston Oil Co.; C. F. Roeser, Roeser and Pendleton, Inc.; H. C. Wiess, Humble Oil & Refining Company.

Rocky Mountain: W. H. Ferguson, Continental Oil Co.; Henry D. Moyle, Wasatch Oil Refining Co.; Paul Stock, Yale Petroleum Company.

Pacific Coast: L. L. Aubert, Bankline Oil Co.; R. C. Follis, Standard Oil Co. of Calif.; W. F. Humphrey, Tide-Water Associated Oil Co.; A. C. Mattei, Honolulu Oil Corp.; Ralph B. Lloyd, Lloyd Corp., Ltd.; Reese H. Taylor, Union Oil Co.



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The Audco-Nordstrom Hypreseal valve can be repacked under full working pressure, and with the valve plug in any operating position. Only a quarter-turn is required to completely open or close the valve. It is erosion-resistant; no vital parts are exposed to line flow. The shearing action of its rotary operation makes the seats self-cleaning.

The Hypreseal type is standard equipment for the majority of leading petroleum operators throughout the world. It has been widely adopted for use on Christmas trees, pipe lines, manifolds and in cycling and refinery operations.

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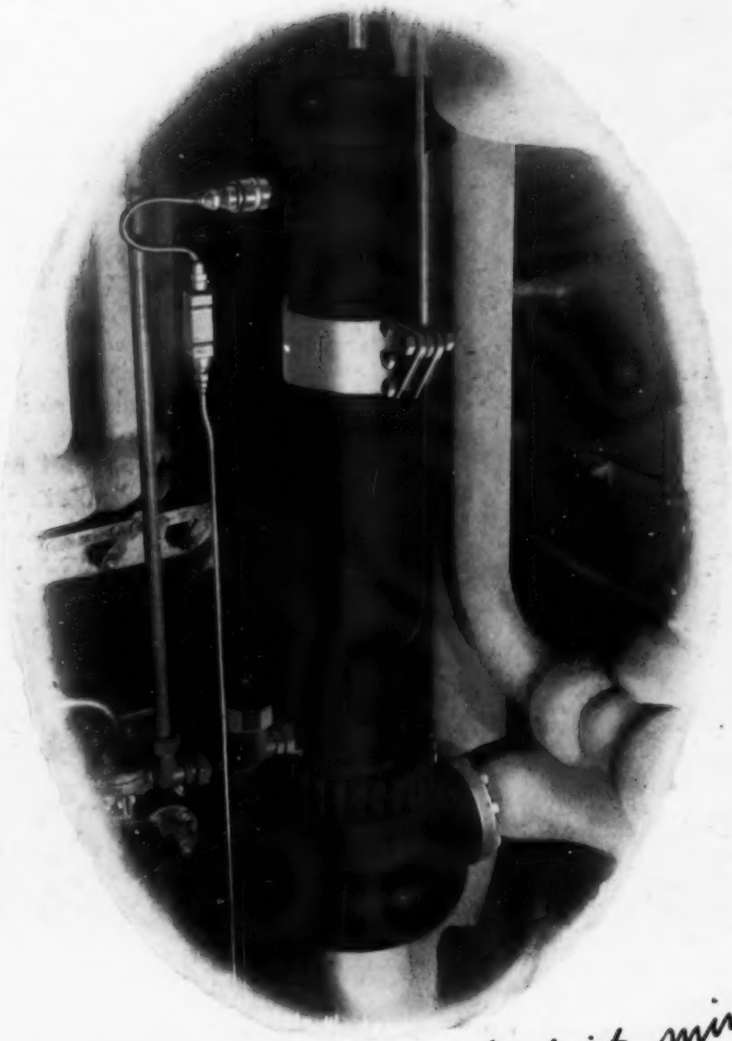

No stuffing boxes. The units can be used for highest pressures. Ribbed neck between pump and motor casings acts as a safeguard when pump is shut down.

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Tilting pad journal bearings.

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Pump suspended on suction and delivery pipes. Free pump movement reduces expansion stresses.

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Motor subjected to full boiler pressure, in this instance, 650 lbs. per sq. inch.

Experiment ... not without its minor excitements

Our Board's idea in installing a La Mont boiler was to test steam pumps and to heat the factory. To our "finding-out" room, this idea no doubt had merits, but obviously the real use of the boiler was as a guinea-pig—to try out their hunch of grafting on a circulating pump, without stuffing-boxes, driven by an electromersible motor. They got down to it with gusto, in an atmosphere of "keep-out—this-means-you". The experiment, to quote a report on the subject, "was not without its minor excitements", and it was a first-class success. Our research people have other hunches awaiting opportunity. If *you* have a pump problem it would be a kindness to let them worry it; we think you would gain by it.

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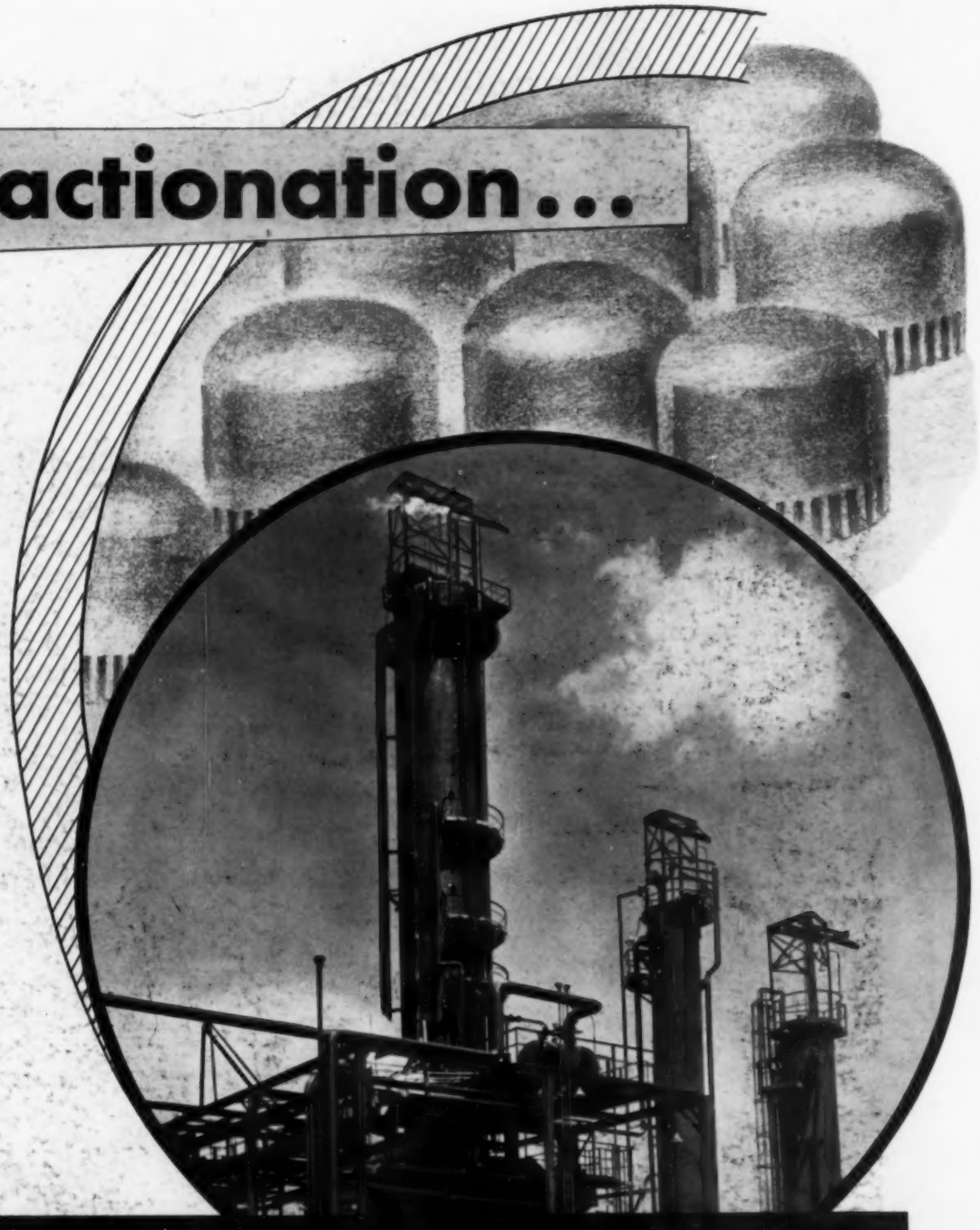

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Completes Year Without Accidents

Completion of a year, comprising 971,000 man-hours worked, without a single disabling accident, was the record established by Socony-Vacuum's Lubrite Division refinery at East St. Louis, Illinois, on November 19. The occasion was celebrated by a two-hour program, during which H. T. Ashton, manager of the Lubrite Division of Socony-Vacuum, and Charles P. Baker, plant manager, commended the employees on their good record. Mr. Ashton also presented to the group a plaque awarded by the National Safety Council.

Certificates of Merit awards were presented to sixteen members of safety committees representing various units and plant shops. Special mention went to several departments for a two, three and four years' no-accident record.

Flowrator Succeeds Rotameter

Announcement is made by Fischer & Porter Company that its flow rate instruments known to the trade for many years as Rotameters are to be designated henceforth as Flowrators. The change is being made in order to describe more accurately the function of these instruments and to meet the criticism that Rotameter suggests a device for measuring rotation or one that measures by a rotating principle.

First use of the term Rotameter appears to have been made about 40 years ago by a continental manufacturer of transparent-tapered-tube-variable-area-flow-rate-indicators. It is indicated that this early manufacturer devised a plumb-bob shaped metering element with biased notches milled on the underside of the metering head to impart a rotating motion. Greatly improved operating stability resulted from use of these rotating elements and the name has stuck tenaciously even though it failed to describe either the function of the instrument or any fundamental operating requirement. As specialists in the manufacture of variable area, indicating, recording, recording-controlling, and integrating flow rate instruments Fischer & Porter Company has devised the "Bead-guide" metering tube and other more positive methods of float stabilization. The old term thus has lost all significance as applied to its products.

No Shortage for 1000 Years

Speaking before the American Society of Mechanical Engineers at a session held in New York in December, Arno C. Fieldner, chief of the fuels and explosives division of the U. S. Bureau of Mines, said that although the country's reserves of natural gas and petroleum might decline its coal and lignite deposits could meet all requirements for not less than 1,000 and probably for 2,000 years.

Mr. Fieldner estimated the presently proved fuel reserves of the United States at an energy equivalent of 2.6 trillion tons of bituminous coal having a heating value of 13,000 B.t.u. per pound. Coal and lignite comprise 98.8 of this reserve. Fifty-five percent of this solid fuel reserve consists of high-volatile bituminous coal, percent sub-bituminous coal, 19 percent lignite, 2.5 percent low-volatile bituminous coal, and 0.5 percent anthracite.

"All of these fuels can be converted by suitable processes to gaseous and liquid fuel," he said. "Satisfactory fuels will be available in the future, for many years, coke and petroleum for many years. Processes and equipment for this purpose have been well-developed, and the costs are known. It is entirely reasonable, therefore, to assume that plenty of gaseous and liquid fuels will be available in the future for many years, probably a thousand," he continued, "and, of course, for a much longer period if atomic energy can be harnessed economically for the generation of heat and power. The cost probably will be greater than the present cost of petroleum and natural gas, but future developments in the more efficient utilization of fuels should go far in offsetting the cost of conversion."

Other possible supplements for petroleum mentioned by Mr. Fieldner included alcohols from the fermentation of vegetable matter; conversion of natural gas by the gas-synthesis process; distillation of oil shale; liquefaction of coal or lignite by the high-pressure hydrogenation process; and conversion of water gas from coal or lignite by the gas-synthesis process. Any or all of these supplementary sources may come into use, he said, as petroleum supplies decline to the point where these higher-cost synthetic products become commercially competitive with natural petroleum products.

WPRA Meets in March

The thirty-fifth annual meeting of the Western Petroleum Refiners Association will be at San Antonio, Texas, March 24, 25, and 26. Among the speakers will be Gov. Beauford H. Jester and John L. McCaffrey, president of International Harvester Company. Technical sessions on March 25 and 26 will include paper on petro-chemicals, Fischer-Tropsch synthesis, octane requirements of automotive engines and catalytic cracking.

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New District Sales Manager

Elton E. Peavy has been appointed southwest district manager for the sale of Dresser products to the oil industry. His territory will include Texas, Louisiana, Oklahoma, Arkansas, Mississippi and New Mexico. He will be responsible for the sale of all Dresser couplings, fittings and repair products in this area. Mr. Peavy succeeds H. R. Shidel who will direct the sale of Dresser welding fittings in this area and supervise the Houston warehouse.

George P. Hough

A. O. Smith Promotes Hough

George P. Hough has been appointed executive administrator of the A. O. Smith Corporation's Chicago district, succeeding Don T. Allen. Hough entered the Chicago office in 1939 to direct the sale of pressure vessels for the oil refining industry. He now has six product sales managers and a force of 35 under his direction selling Smith products in ten middle-western states.

RALPH B. LLOYD was reelected president of Western Oil and Gas Association at the annual meeting of the association at Los Angeles in December. With his reelection Mr. Lloyd, president of Lloyd Corporation, Ltd., begins his sixth consecutive term. Other officers elected by the association were William Reinhardt first vice president (Union Pacific); H. D. Collier, second vice president (Standard); L. K. Whittier, treasurer (Belridge Oil Co.); Don E. Gilman, executive vice president, and D. S. Kilgour, secretary.

CHARLES E. SPAHR has been named assistant to the vice president in the transportation department of The Standard Oil Company (Ohio). He joined Sohio as an engineer in the transportation operations division in 1939 and served with the army in India-Burma from 1941 through 1945. He has been the industrial relations assistant in the transportation department since his return.

STANDARD OIL DEVELOPMENT COMPANY has elected three new vice presidents and directors. Willard C. Asbury will be in charge of contract and patent activities, and E. Duer Reeves and Dr. William J. Sweeney will direct the company's work in research and development. William R. Carlisle, a vice president and director of the Development Company, has been appointed associate general counsel of Jersey Standard. In addition to his new duties, he will remain a director of S. O. D.

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Sunray Builds Product Line

Sunray Oil Corporation will construct 83 miles of 8-inch pipeline from its Allen, Oklahoma, refinery to Drumright, as soon as equipment can be obtained, F. L. Martin, vice-president in charge of refining, announced recently. Cost will be approximately $1,000,000. The line will form a connection at Drumright with the Great Lakes Pipe Line Company's system, thereby facilitating deliveries of Sunray's finished gasolines and other light petroleum liquids to northern and northeastern sections of the country. Sunray will construct a pumping station at Allen, capable of handling a pipeline throughput of about 20,000 barrels of gasoline a day.

Routed through Bristow, the Sunray line will also receive gasolines produced at the Wilcox Oil and Gas Company's Bristow refinery, for delivery into the Great Lakes company's system. Wilcox will have half ownership of that portion of the line between Bristow and Drumright, a distance of about 16 miles.

Reverse Portal to Portal Claims

When four officials of local unions filed "portal to portal" claims for $3,000,000 against the Pittsburgh Equitable Meter division of Rockwell Manufacturing Company, they received a prompt response from Colonel W. F. Rockwell, president of the company. This took the form of a counter suit for $15,000,000 against the four individuals and "the persons they claim to represent," in other words, the unions. The counter-claim is based on alleged violation of the employee contract with respect to hours worked and productive effort. It is stated that some employees have not worked eight hours a day or forty hours a week, though expecting and receiving compensation for such periods.

Harts Heads Convention Committee

H. W. Harts, vice president of Warren Petroleum Corporation, Tulsa, is to head the 1947 convention program committee of the Natural Gasoline Association of America. The convention is to be held April 23-25 in the Baker Hotel, Dallas. Others on the committee include: W. L. Bowser, Atlantic Refining Co., Dallas; F. B. Haverfield, Continental Oil Co., Ponca City; Max Lents, J. S. Abercrombie Co., Houston; James E. Pew, Sun Oil Co., Philadelphia; W. H. Vaughan, Tidewater Associated Oil Co., Houston; and C. R. Williams, Chicago Corporation, Corpus Christi.

Rheem Expands

Rheem Manufacturing Company recently purchased a 56-acre industrial site just north of its present Richmond, California, plant. R. S. Rheem, president, stated that the existing Richmond property is inadequate to provide for any major plant expansion. In addition to its Richmond, California, plant, Rheem manufactures steel shipping containers and basic appliances at nine others in the United States and several affiliated plants abroad.

T. D. Collins Joins Ideco

Appointment of T. D. Collins as vice president has been announced by International Derrick and Equipment Company. Mr. Collins makes his headquarters in Dallas. He is in charge of supply stores and direct sales in the Mid-Continent, Gulf Coast, Rocky Mountain and Illinois divisions. Collins entered the oil field supply business with Continental Supply Company at Ranger, Texas, in 1927 and was with Continental for 20 years. Before coming with Ideco, he was in charge of West Texas, North Texas and New Mexico divisions.

Prepares Vapor Pressure Chart

Phillips Petroleum Company's chemical products department has prepared a large scale vapor pressure chart, entitled "Vapor Pressures of Twelve Four-Carbon-Atom Hydrocarbons." The hydrocarbons included are isobutane, isobutylene, 1-butene, 1, 3-butadiene, n-butane, trans-2-butene, cis-2-butene, vinylacetylene, ethylacetylene, diacetylene, 1, 2-butadiene and dimethylacetylene. Vapor pressures from 0.30 to 800 psia are shown over a temperature range of — 110 to + 320 F. Single copies are free on business letterhead requests to Phillips at Bartlesville, Okla.

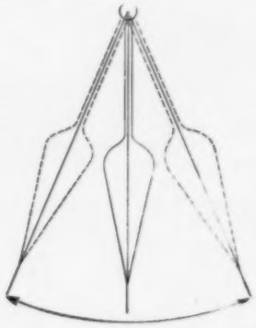
Awarded Contract for Catalyst Change

Contract has been awarded by Socony-Vacuum Oil Co., Inc., to Catalytic Construction Company for catalyst change in its six-case Houdry fixed-bed unit at Paulsboro, New Jersey. Contract for the work was based on a fixed price quoted by Catalytic Construction Company. Work is already begun, and it is estimated that it will be completed in six weeks.

1946 Annual Index

An index to all issues of WORLD PETROLEUM published in 1946 now is in course of preparation and will be ready for distribution to subscribers soon. Copies will be sent free of charge on request. Please address your card or letter to Editorial Department, WORLD PETROLEUM, 2 West 45th St., New York 19, N. Y.

What's the Object of Using a Mechanically Operated Instrument That Can Give a False Record . . . When



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2. On Sand Line.
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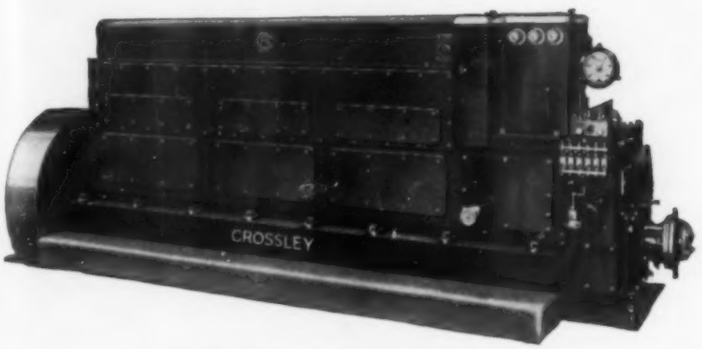

Typical Illustration of 600BHP Engine

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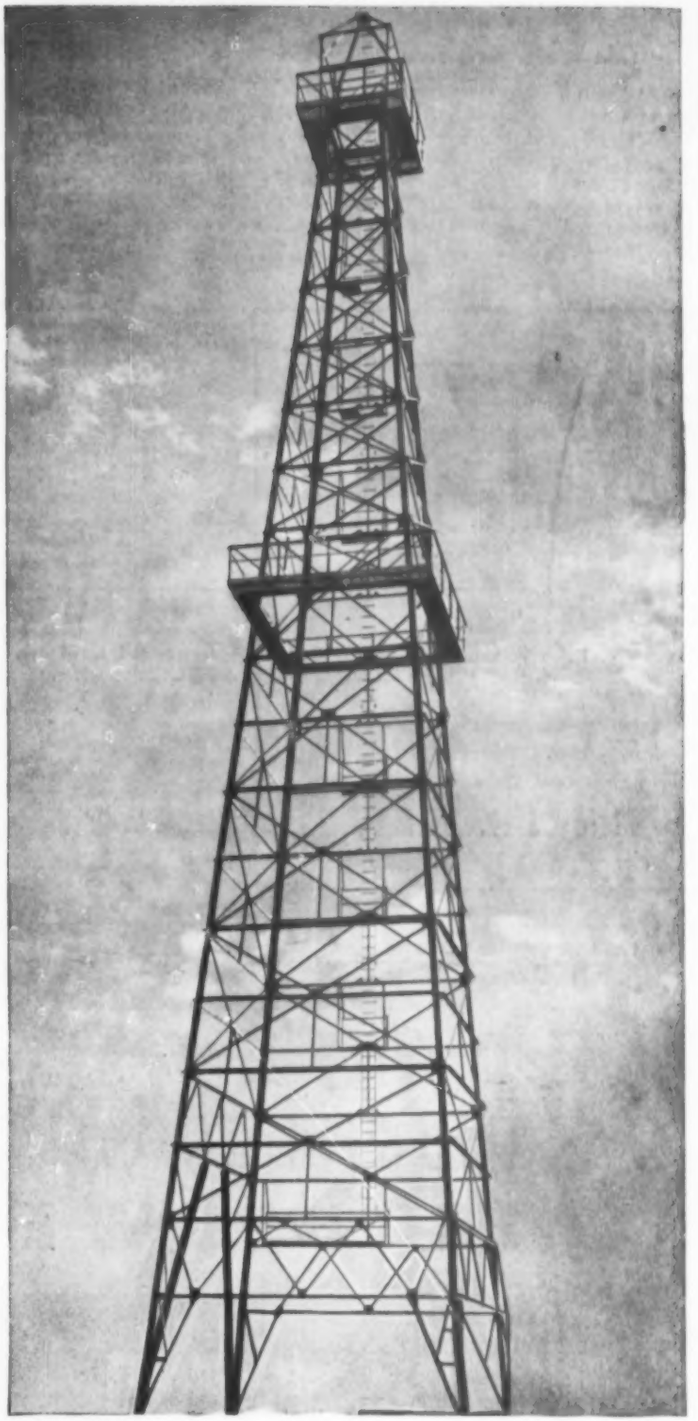

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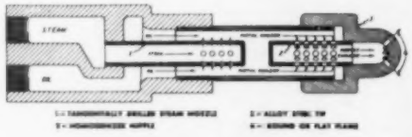
Tide Water Buys Five Tankers

Tide Water Associated Oil Company has purchased five modern T2-SE-AL tankers. Cost of these ships is $10,132,500. The new vessels will replace tonnage lost during the war and old tankers to be withdrawn from service. After the acquisition of the five new tankers, the Tide Water Associated tanker fleet will consist of fourteen ships totalling 191,000 tons.



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Appointed To Texas Commission

William J. Murray, Jr., of Houston, has been appointed to the Texas Railroad Commission to succeed Beauford H. Jester who is now governor of the state. Mr. Murray is a graduate of the University of Texas and has been connected with the oil and gas division of the commission for several years, holding the post of senior engineer prior to his appointment as a member of the commission.

Oil Across the World

While many books have been written about oil, most of them have dealt primarily with production or refining. It remained for Charles Morrow Wilson to fill a serious gap that heretofore has existed with his informative and entertaining volume, "Oil Across the World," which is appropriately subtitled, "The American Saga of Pipe Lines."

Mr. Wilson deals briefly but interestingly with the historical development of pipes and their earlier use for conveyance of water and steam, but his main concern is with the pressure-operated pipe line and its important part in the economy of the oil industry. He traces the crude beginnings of this form of oil transportation and describes some of the early lines built in Pennsylvania and the Mid-Continent and the picturesque men responsible for their construction.

Special chapters are devoted to the Big Inch and Little Big Inch which played so vital a part in the winning of the late war. Attention is given to the economics of pipe line transportation with a look at possible future developments. The book is enlivened by 32 pages of photographic reproductions illustrating pipe line construction.

A valuable feature of the work is the Pipeline Manual contributed by William G. Heltzel, general manager, Stanolind Pipeline Company, including pipe line nomenclature, formulas and tables.

"Oil Across the World," 320 pages. Published by Longmans, Green and Co. $3.50, available through *World Petroleum* book department.

Moves Chemical Offices

The Shell Chemical Corp. has moved its district sales office from the Deer Park plant to new quarters in the Shell Building at Texas Avenue and Fannin Street. The Houston district manager is E. R. Scogin who has been with Shell since 1942 as a chemist in the Houston plant, and in sales and as chemical service representative in Texas, Oklahoma, Louisiana and Mississippi.

R. B. BEDFORD, JR., has been named assistant manager of the marine fuel oil sales department of the Standard Oil Company of New Jersey. Mr. Bedford joined the company in 1930 and in 1940 was named head of the company's marine shallow draft sales unit. He was made a senior marketing assistant in charge of marine fuel oil sales, his most recent position, in July 1041. G. H. Hamilton has taken over the marketing duties formerly carried out by Mr. Bedford.

JOHN TANCRED, JR., sales promotion manager, Jarecki Manufacturing Company, Houston, Texas, died January 20 in a Clarendon, Texas, hospital of injuries received in an automobile accident near that city. Mr. Tancred served in three South Pacific invasions and was discharged in January 1946 with the rank of Lt. Colonel in the Army air forces.

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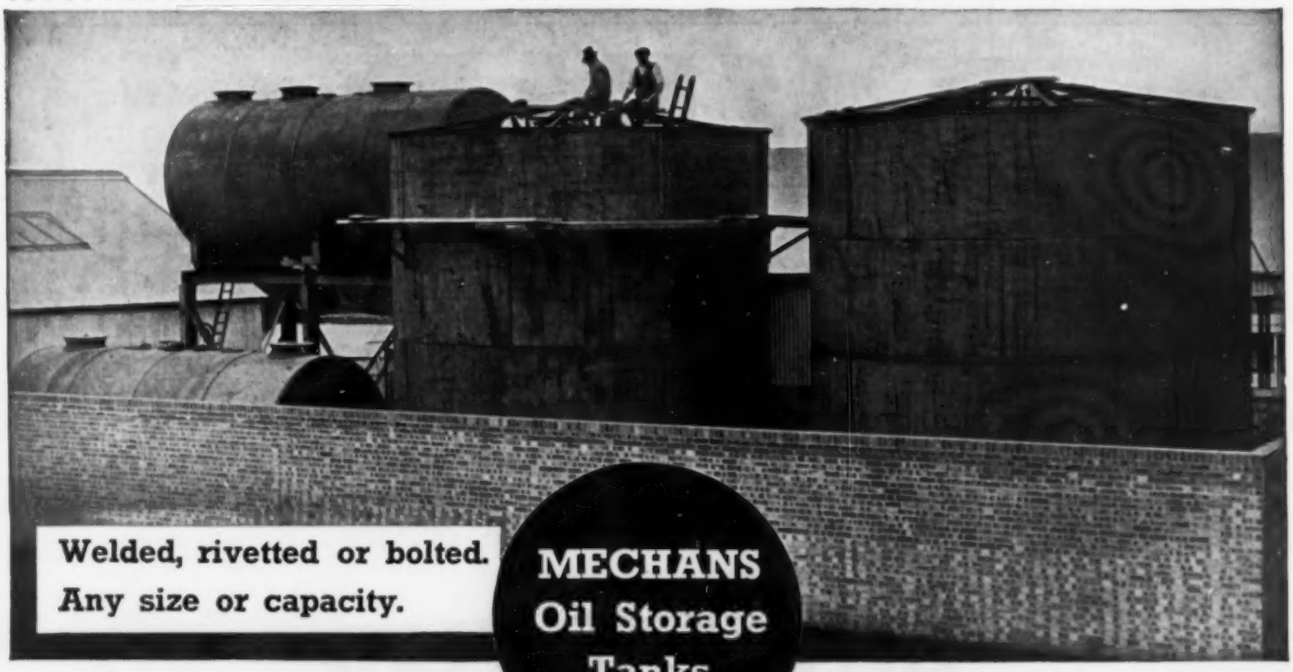
ILLUSTRATION SHOWS TANKS DURING ERECTION AT OIL SERVICE STATION



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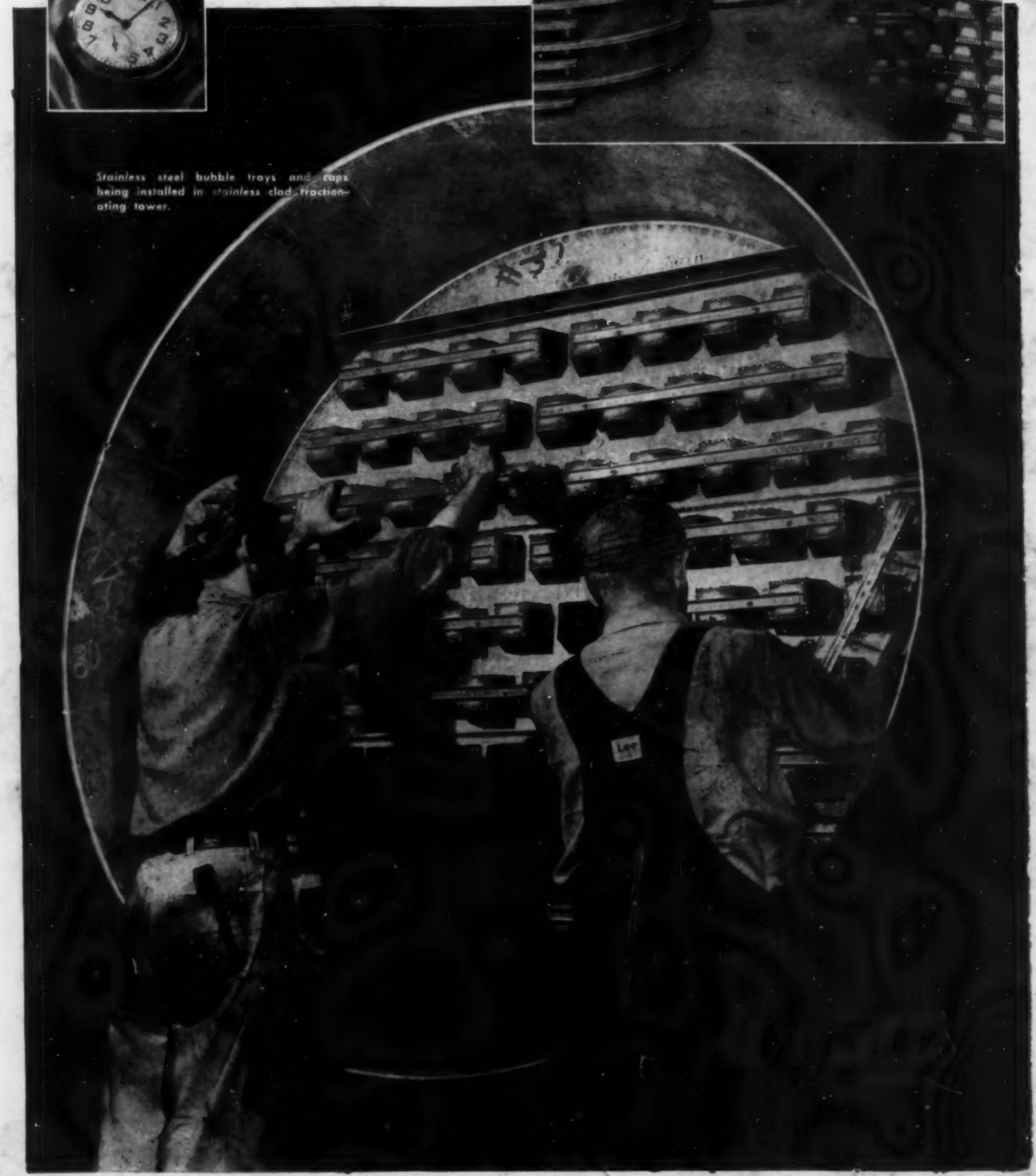

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